Public Utilities

Volume 60 No. 3 August 1, 1957

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ARTICLES

FEATURE SECTIONS

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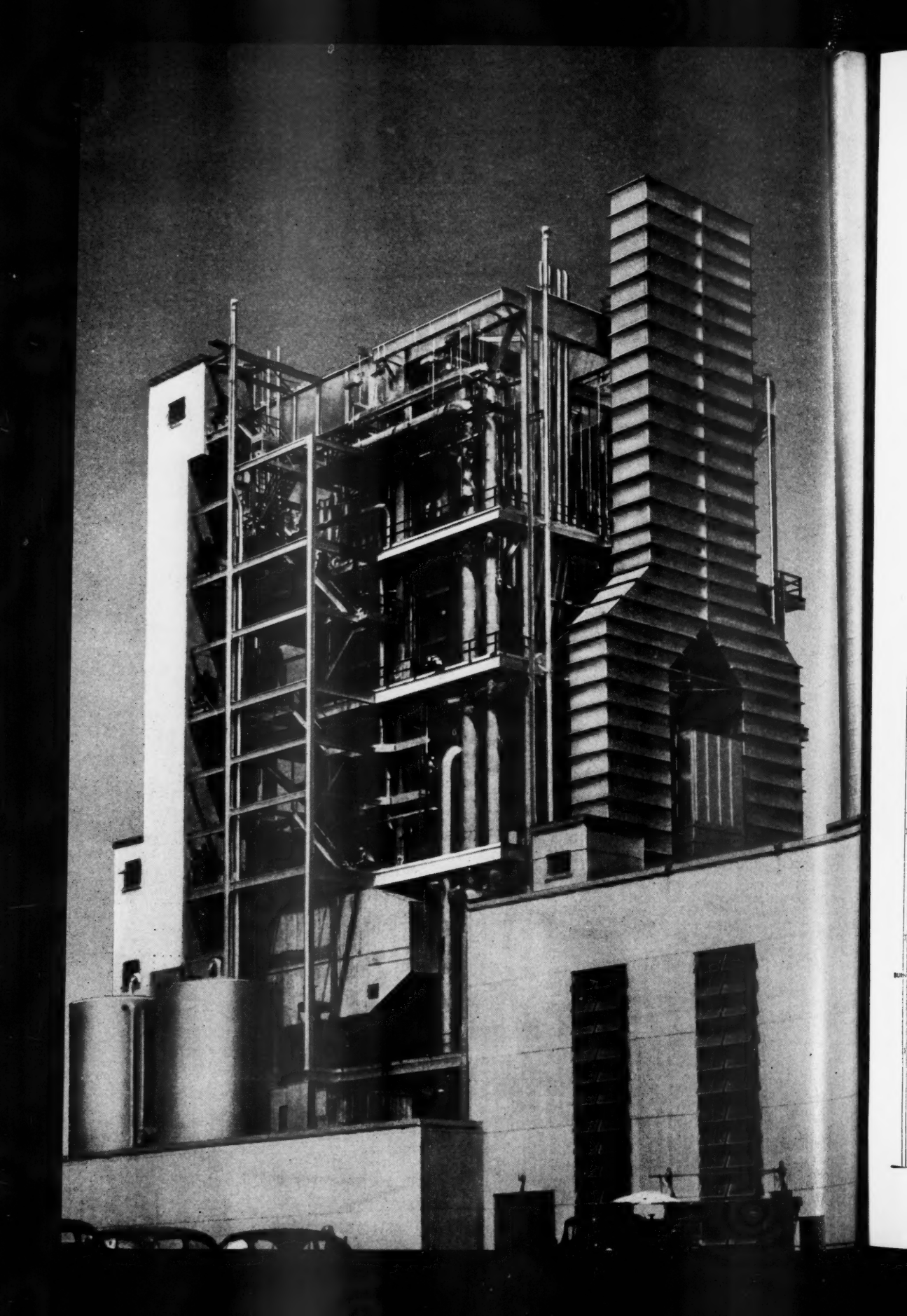


Advanced B&W Engineering in New Radiant Reheat Boiler Helps Produce

More Low Cost Power for Oklahoma

A B&W Radiant Reheat Boiler, burning natural gas, has gone on the line at the Riverbank Station of Oklahoma Gas & Electric Company at Muskogee. It is equipped with fifteen of the largest gas spud burners ever manufactured by B&W, and is designed for future conversion to coal-burning.

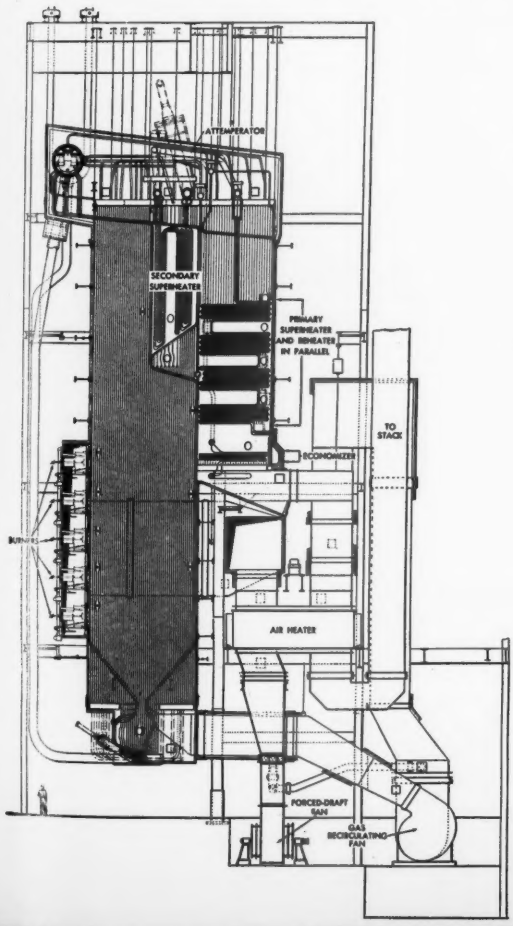
Among Design Features assuring increased station generating efficiency with this boiler is the recirculation of gas for steam temperature control. The gas is introduced without interference with the combustion process. Recirculation of a portion of the flue gas in a boiler makes it possible to obtain the desired steam temperature at specified fractions of full load—an important requirement for top turbine performance.

Natural Circulation is made possible by B&W Cyclone Steam Separators. This brings about really important savings in operating and maintenance costs. B&W's steam separating system insures high purity steam for the turbine and keeps the turbine on the line for longer periods between cleanings. Higher turbine efficiency is consistently maintained.

These B&W engineering advances, plus proved high availability, are major reasons why Oklahoma Gas & Electric has on order two more units similar to the new Riverbank boiler. Other B&W Boilers already are at Mustang Station, Oklahoma City; Horse Shoe Lake Station, Harrah, and Arbuckle Station, Sulphur.

Important to Oklahoma Gas & Electric and its engineers, in selecting B&W Boilers, was the friendly service and excellent engineering so close at hand from the nearby link in a national chain of plants and engineers. Progressive electric companies and their consulting engineers know that nearly a century of steam generating experience supports B&W research, development, engineering, and design. This pool of knowledge is available to you, to help you meet your central station requirements. The Babcock & Wilcox Company, Boiler Division, 161 East 42nd Street, New York 17, New York.

G-838-CS



B&W Radiant Reheat Boiler at Oklahoma Gas & Electric Company's Riverbank Station. Steam capacity is 1,200,000 lbs per hr. Boiler design pressure is 2150 psi. Steam pressure is 1935 psi at superheater outlet and temperature is 1005F with reheat to 1005F. Sargent & Lundy, Chicago, Consulting Engineers.

BABCOCK & WILCOX

BOILER DIVISION

Pages with the Editors

EVER since the dawn of recorded history mankind has been fascinated by the idea of converting the heat of the sun to his own purposes. The ancient Greeks and Egyptians experimented with various known forms of heat-conducting materials in an effort to harness the rays of the sun and put the retained heat to some useful purpose.

THE total amount of solar energy incident upon the earth's surface is very great. It has been estimated that onto every square mile of the Sahara Desert the sun pours over a 6-hour day approximately 67 billion British thermal units of heat. And the area of this desert is 2.3 million square miles. If, therefore, only a minute fraction of this heat could be utilized, it would go far to realizing the prophetic words of a great chemist (G. Ciamician): "The exhaustion of coal will not halt civilization, destined to advance as long as the sun shines. Then our sooty and neurotic age of coal will yield to a purer and calmer epoch, relying upon solar energy for a fortune and a progress without mischance."

MORE recently, with the broader knowledge of the characteristics of solar heat and the much greater variety of materials and contrivances available, solar appliances have shown much greater promise of practical adaptation. And there is good reason—from the standpoint of world economy—to cultivate such studies and experimentation.

JAMES H. COLLINS

JOHN I. YELLOTT

DURING the first half of the twentieth century, the amount of coal used to generate one kilowatt-hour of electricity dropped from seven pounds to less than a pound, or its equivalent in other fuels. But there is widespread belief among engineers that the industry has just about reached the limit of technical efficiency with respect to fuel economy, so that during the second half of the twentieth century a shortage of fossil fuels promises to become a real problem of world economy. Some nations already are in short supply and some have none at all of their own.

THE best of the hydroelectric sites already have been developed and the economic utilization of atomic power is still an unknown quantity. Hence the continued interest in the possibility of using solar energy, which is the abundant and everlasting heritage of the entire world. JOHN I. YELLOTT, executive director of the Association for Applied Solar Energy, Phoenix, Arizona, has written a comprehensive analysis of the possibilities of solar energy utilization, amply supplemented

how Fish Service Corporation helped bring a new age of energy to SPOKANE

From initial Survey to final completion Fish Service Corporation supervised all steps in converting Spokane Natural Gas Company from an obsolete Propane-air utility to a modern, efficient natural gas distributing system.

IN EARLY 1953 Spokane Gas and Fuel Company saw little hope for the future. Sales were declining, the system was obsolete, cash was low, and prospects were so dim new financing was hard to get.

Then, with the promise of Natural Gas via pipeline from the San Juan Basin, things began to look up. But the company had little experience in planning, financing and executing the modernization required to take advantage of the new supply.

The management then turned to experts. Fish Service Corporation was retained to take charge of all phases of the change.

First Fish made a survey. Then, based on that survey, new financing was obtained. On behalf of the company, Fish went before the state regulatory commission and the F.P.C. The system was modernized and enlarged with supervision and inspection by Fish. Rate structures were calculated by Fish, and the company organization was improved. Even the name was changed to the Spokane Natural Gas Company.

Results were gratifying. Demand went up immediately. By December 1957, demand is expected to reach a peak of 37 million cubic feet per day. A sick, declining company had been transformed to a vigorous, growing one.

This may be an extreme example, but Fish Service Corporation may be able to help you, too. Why not call us and find out.

FISH SERVICE CORPORATION

HOUSTON, TEXAS

fish SERVICE CORPORATION

with graphic illustrations in the opening article of this issue.

THE author, MR. YELLOTT, is a graduate of Johns Hopkins University in mechanical engineering (BS, '31; MS, '33). He has taught engineering at the University of Rochester, Stevens Institute of Technology, and the Illinois Institute of Technology, where he was head of the department of mechanical engineering and later director of the Institute of Gas Technology. From 1945 to 1955 he worked on the problem of making gas turbines burn coal—a research project of Bituminous Coal Research, Inc. He joined the Association for Applied Solar Energy in 1956 and is now a leading figure in that field of research.

* * * *

THREE years ago former REA Administrator Ancher Nelsen invited members of the electric utility industry, both business-managed companies and REA cooperatives, along with equipment manufacturers and agricultural experts, to a joint meeting on the subject of farm utilization of electricity. The purpose of this conference was to discuss ways and means for expanding farm use of power and out of it grew the Inter-Industry Farm Electric Utilization Council. GUY W. THOMAS, vice president, commercial operations, Public Service Company of Colorado, in his article beginning on page 158, describes the organization, development, and operation of this group, which is providing leadership in the accomplishment of more and better use of power on the farm.

MR. THOMAS is a veteran of thirty-eight years in the utility business. He joined the Public Service Company in 1919, shortly after graduating from the University of Iowa with a BS degree in electrical engineering. He started utility sales work in 1920 and became assistant commercial manager in 1951, manager of that department in 1953, and vice president of the company in 1956. He is president of the Rocky Mountain Electrical League.

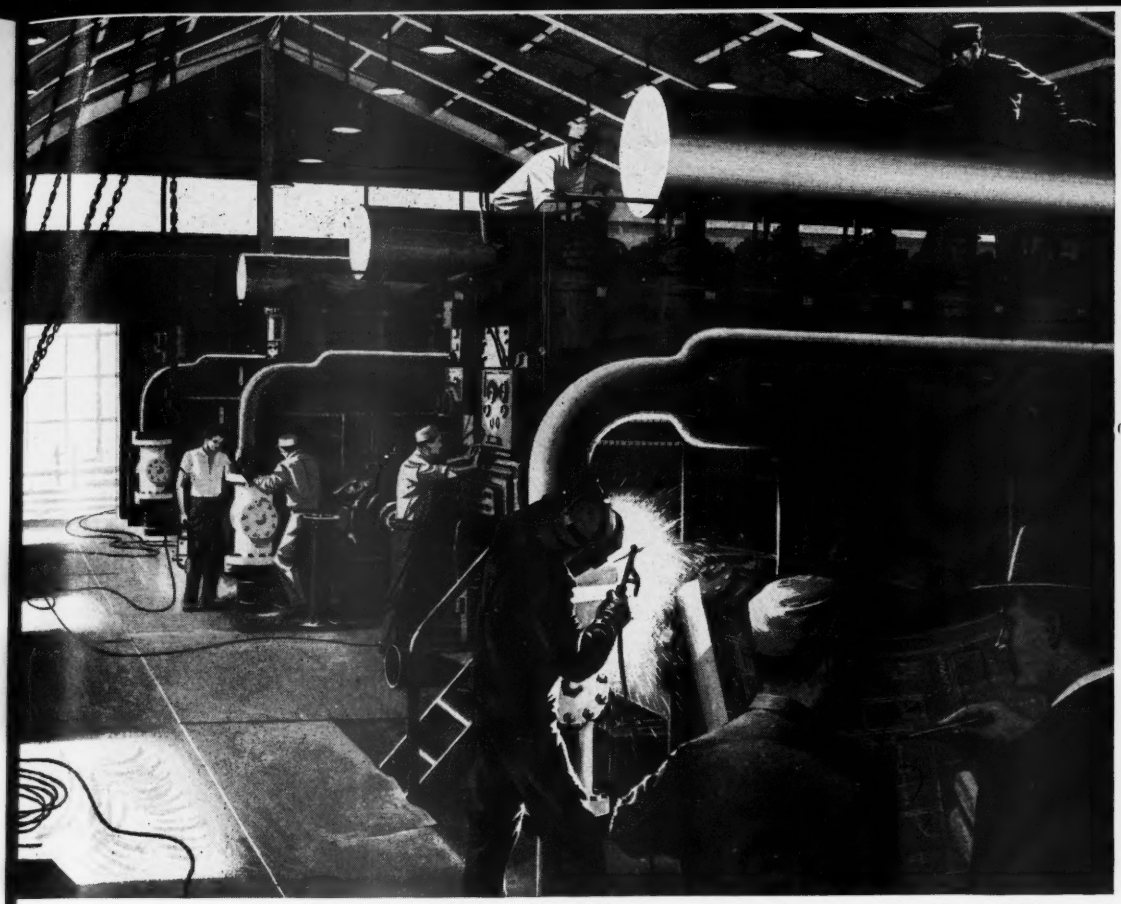
GUY W. THOMAS

WITH all due reverence for Joyce Kilmer's inspired poem about trees, the fact is that the human race is going to have to co-operate a lot more in growing them if our present rate of wood usage continues to increase. Few of the once vast areas of timber reserves remain, while the wood chopper's ax continues to take its toll more rapidly than replacements can be grown. Fortunately, public utility companies are now finding wood conservation to their advantage.

UPPER PENINSULA POWER COMPANY in northern Michigan, started eight years ago what has come to be known as a "tree farm," and put 45,000 acres of timberland under the management of professional foresters. There were several reasons for this move: to insure continued supply of basic material for the company's best customers, to see how modern management methods would work out, and to provide attractive forests for recreational facilities. Southern California Edison is another utility company which has gone in for forestry. In his article beginning on page 165, JAMES H. COLLINS, professional writer of business articles, reports on this interesting innovation of utility company practice.

THE next number of this magazine will be out August 15th.

The Editors



New compressor stations, like the one pictured above, are constantly being built to meet the steadily increasing demands for natural gas. These compressor stations pump natural gas through Columbia's 36,716 miles of pipeline to homes and industries in America's Heartland.

Columbia's Thinking Is *Constructive*

Customers in the area served by the Columbia Gas System keep calling for more and more natural gas —to meet a constantly increasing need for energy. To supply it, facilities with greater capacity must be constructed—new or enlarged compressing stations, pipe lines, metering stations and other equipment. So Columbia must think constructively!

During the past decade, the Columbia Gas System has spent more than a half billion dollars for construction. This year alone, Columbia expects to spend about $87 million on new facilities—to meet immediate and future natural gas requirements of more than three million families, businesses and industries in the dynamic and growing Heartland of American commerce and industry.

Where System companies serve within this seven-state Heartland—Pennsylvania, Ohio, West Virginia, Virginia, Kentucky, Maryland and southern New York—Columbia's residential sales have doubled, its househeating customers have increased almost three-fold in just ten years.

Growth in the Heartland shows no signs of diminishing . . . so to keep pace with the Heartland's growth, to provide the facilities and the service a growing number of customers require, Columbia thinks and plans constructively for the future.

serving homes and industry in America's Heartland

COLUMBIA GAS SYSTEM

THE COLUMBIA GAS SYSTEM, INC.

COLUMBIA GAS SYSTEM SERVICE CORPORATION

120 East 41st Street, New York 17, N.Y.

CHARLESTON GROUP: United Fuel Gas Company, Amere Gas Utilities Company, Atlantic Seaboard Corporation, Central Kentucky Natural Gas Company, Virginia Gas Distribution Corporation, Kentucky Gas Transmission Corporation
COLUMBUS GROUP: The Ohio Fuel Gas Company . . . **PITTSBURGH GROUP:** The Manufacturers Light and Heat Company, Columbia Gas of New York, Inc., Cumberland and Allegheny Gas Company, Home Gas Company

Coming IN THE NEXT ISSUE

(August 15, 1957, issue)

★

THE RÔLE OF REGULATION IN A DEMOCRACY

It has been said that the rise of the administrative boards has been the most significant legal trend of the century and that more values are affected today by their decisions than are those by all the courts acting on cases other than administrative appeals. The Honorable Arthur L. Padrutt, member of the Wisconsin Public Service Commission, has made a thoughtful analysis of the genesis of the state public service commission as part of this trend towards administrative law. As in other states, Wisconsin first attempted to regulate utilities by direct legislation, then by a board with limited powers which were gradually expanded until in 1907 it became one of the first states (the other was New York in the same year) to establish a full-powered public service commission with jurisdiction over all major forms of public utility enterprise.

VARIATIONS OF CAPACITY COSTS IN UTILITY SERVICE

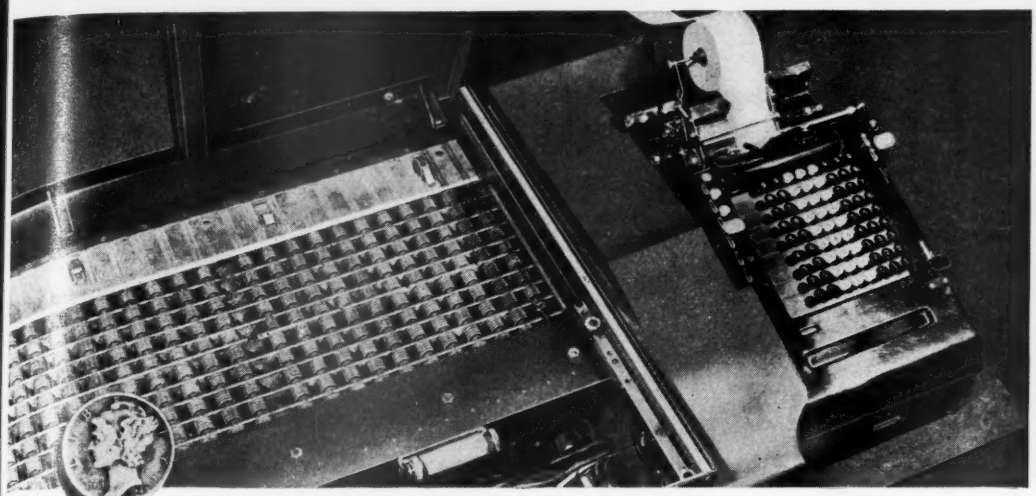
There are many differences in cost and price of natural gas as compared with electric utility operations. Orrin S. Vogel, director of economic research, Florida Power Corporation, St. Petersburg, Florida, gives us an analysis on how capacity costs vary in relation to the different types of utility service. Mr. Vogel's study shows how the problem of "costing" as distinguished from "pricing" the relative factors of demand (capacity) and output cannot be treated in rate making for an electric utility along exactly the same lines as treatment for natural gas rate making. Such additional factors as storage availability and interruptible supply for gas customers make the allocation of capacity costs more flexible than in the case of an electric utility obligated to serve all customers without the advantage of storage facilities.

KEEPING UNCLE'S NOSE OUT OF STATE AFFAIRS

It is axiomatic that the states cannot get federal money without taking the advice and controls that go along with it. The recent controversy over highway billboard regulation is a case in point. T. N. Sandifer, well-known Washington correspondent and author of business articles, has written an entertaining account of the way Uncle Sam uses the federal government as a funnel for channeling all blessings of government benefits to the states, along with an ever-increasing amount of dictation and policy control.

★

Also . . . ***Special financial news, digests, and interpretations of court and commission decisions, general news happenings, reviews, Washington gossip, and other features of interest to public utility regulators, companies, executives, financial experts, employees, investors, and others.***



Money maker for the company and you-

Just as sure as if it coined actual cash the work done by our "Bill Frequency Analyzer" * will swell your company coffers!

The work it does produces rate analyses faster and more accurately than *any* other method—a sure protector of profitable rate revenue when done on a monthly basis—a real boon when rates are reviewed.

Complete *monthly* analyses by the "One Step" method give you an always true picture of your rate revenues, never a distortion such as occurs when a few months 'sampling' is used as a check. This is of paramount importance when submitting figures to Rate Commissions, and when the figures are compiled by R & S they really rate in rate cases.

R & S specializes in serving utility companies all over the country – we know your problems, know how to interpret your requirements and give you any break-down in report form you may require . . . minimums, demand rates, and so on.

We can conclusively prove to you that our "One Step" method of rate analysis will *make money for the company and you* – all we need is a sample of your billing sheet, a copy of rate schedules and an estimate of the number of customers billed at each rate, and your frequency table requirements. From these we can give you an estimate of costs and a time table for production – both will be eye-openers! Write Dept. P today.

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Remarkable Remarks

"There never was in the world two opinions alike."
—MONTAIGNE

HARRY TRUMAN
Former President of the United States.

"[The present power] partnership where everything is divided even-Stephen—the electric company gets the powerhouse and the government gets the fish ladder."

E. F. TOMPKINS
Columnist.

"The real way to 'stabilize' the economy is for the government to curtail its own expenditures, stop borrowing needlessly, and start reducing the national debt."

W. RANDOLPH BURGESS
Under Secretary of the Treasury.

"[Control of the national debt] depends on the cooperation of all the people—they decide by their pressures or by their inattention what they want and are willing to pay for."

GEORGE M. HUMPHREY
Secretary of the Treasury.

"We are on sound economic ground, based on sound economic principles, and there is no reason why we should not go forward unless confidence is badly injured or destroyed."

W. J. MCGILL
General manager, industrial and public relations, Standard Oil Company (Indiana).

"A corporation is a social institution in a social environment, and, try as they might to ignore the fact, those making its decisions will have relations with various publics, whether good or bad."

ROGER M. BLOUGH
Chairman of the board, United States Steel Corporation.

"If some of the present-day pessimists . . . were to start counting the new arrivals in what I believe is known as Crib-town, U.S.A., my guess is they would soon stop singing the calamity blues."

WILLIAM F. KNOWLAND
U. S. Senator from California.

"My practical knowledge of Washington leads me to the conclusion that nothing terminates in four years. And I have never seen the federal government contribute money without wanting to exercise control."

GEORGE E. SOKOLSKY
Columnist.

"Money moves to the place where profits are good and safety is assured. If it moves from the United States to Puerto Rico or Canada or anywhere, it means that there one can make a profit and the money is safe."

BENJAMIN F. FAIRLESS
Former chairman of the board, United States Steel Corporation.

"If our forefathers had tried to freeze our way of life into the primitive patterns of 1776, the whole glorious story of American independence would today be no more than a tragic paragraph on some forgotten page of history."

MAJOR GENERAL E. C. ITSCHNER
Chief of Engineers, U. S. Army.

"Railroads are the backbone of the national transportation system, and the nation's economy would collapse without them. . . . We are deeply aware of the indispensable rôle of railroads in time of war or national emergency."

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NEW ISSUE

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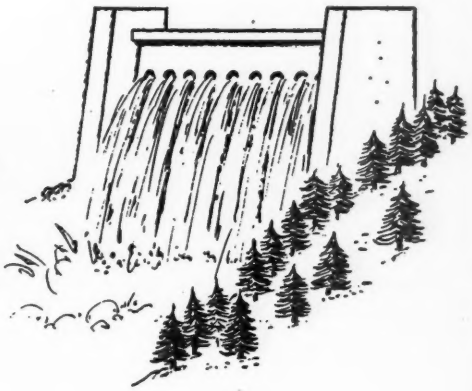

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July 10, 1957

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HIGHGROVE
PLANT X
BLACK DOG
ALBANY
JOPPA
MERAMEC
PORTSMOUTH
LAKE CREEK
ETIWANDA
AURORA
HENNEPIN
EASTLAKE
OAK CREEK
SUWANNEE RIVER
URQUHART
KINGSTON
SANDOW
MULLERGREN
BARRY
NORTH OMAHA
WILMINGTON
CARBON
SAGUARO
MORRO BAY
VERMILION
JOHN SEVIER
COLLIN
MILLIKEN
GALLATIN
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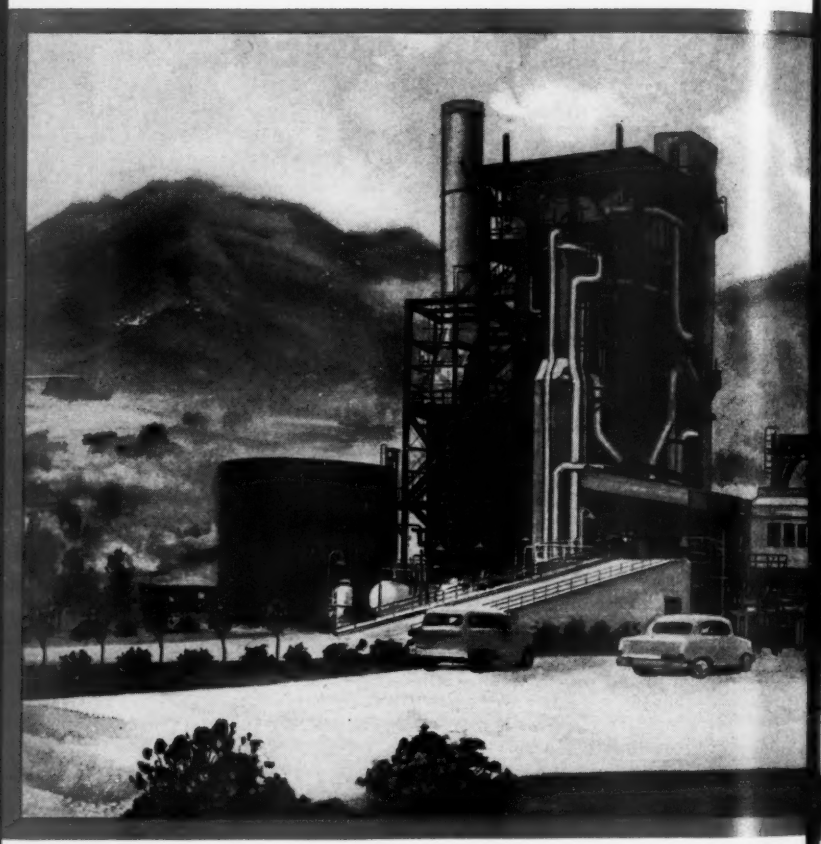
SAN BERNARDINO

New San B

goes in



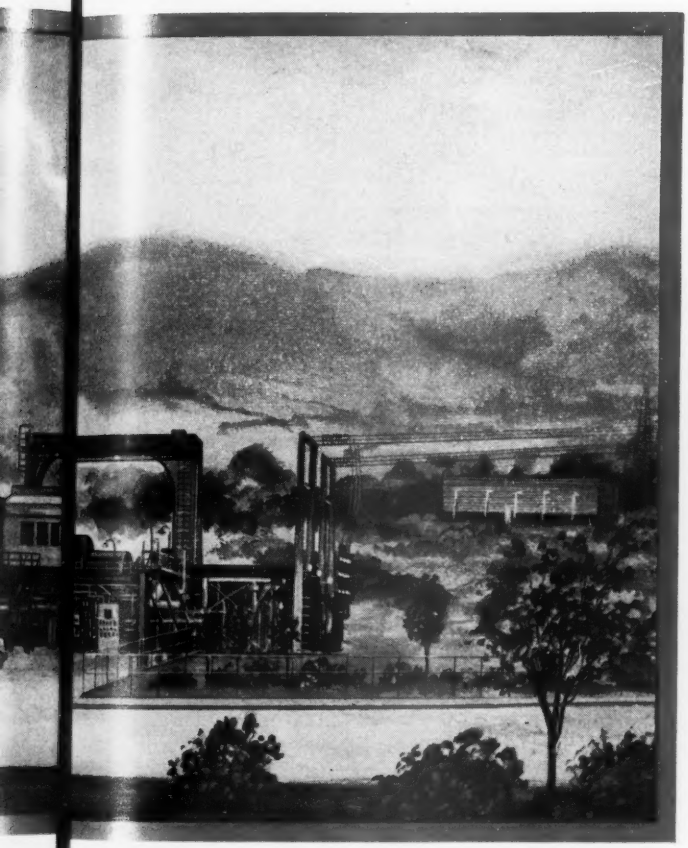
Unit No. 1 of California Electric Power Company's new San Bernardino Steam Electric Generating Plant was recently placed in operation. The 60,000 kilowatt unit is the first of a series of four units planned for this site to meet the power demands of an ever-growing Southern California. A second 60,000 kilowatt unit will be placed in service in mid-1958.

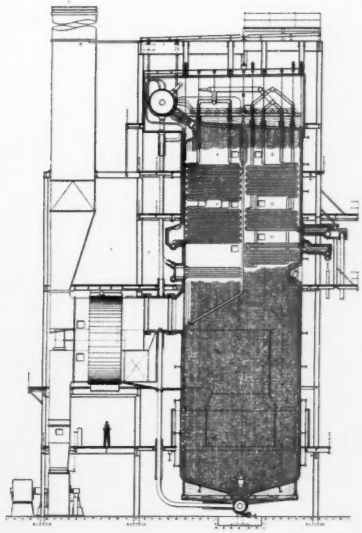
Located near the city of San Bernardino, this modern station of outdoor design was planned and constructed by the Fluor Corporation under the general supervision of Calectric's engineering department. Its power will be

ALL TYPES OF STEAM GENERATING, FUEL BURNING AND RELATED

anBernardino Plant

pesinto service





The C-E Unit shown above is now in service at the San Bernardino Steam Electric Generating Plant. A duplicate is presently under construction. These are radiant, reheat boilers with the reheater section located between the primary and secondary superheater surfaces which are directly above the furnace. An economizer section is located below the rear superheater surface and regenerative air heaters follow the economizer section. Steam is produced at a pressure of 1850 psig and a temperature of 1000 F, reheated to 1000 F. The unit is fired with natural gas and oil employing tilting, tangential burners.

transmitted at 115,000 volts to an electric service area that is one of the fastest-growing in the United States.

The San Bernardino plant is one of a number of power-producing facilities that Calectric is building throughout its service area. Four units at Highgrove are already in operation, and new units will be constructed soon at Barstow and on the Colorado River.

Steam for the new units at San Bernardino will be supplied by C-E Steam Generating Units, a cross-sectional elevation and brief description of which appear at the upper right.

C-102

COMBUSTION ENGINEERING

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RELATED EQUIPMENT; NUCLEAR REACTORS; PAPER MILL EQUIPMENT; PULVERIZERS; FLASH DRYING SYSTEMS; PRESSURE VESSELS; SOIL PIP

Actual road tests prove Dodge outpulls "other two" low-priced trucks by 32%

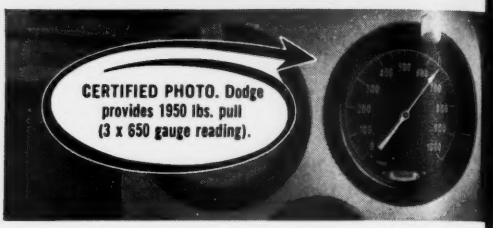
Dodge gives you *Extra Pull* . . . cuts running time and maintenance costs

Here is definite proof that Dodge gives you a big power advantage that will pay off on your hauling jobs.

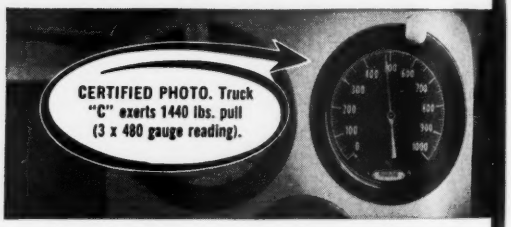
All three low-priced trucks were recently compared side by side in a grueling series of performance tests. The dynamometer test shown here is only one of them. And in each test . . . *climbing power* . . . *passing power* . . . *pulling power* . . . Dodge proved the outstanding truck of the low-priced three.

Extra power does it. From 204- to 232-hp. V-8's, Dodge *Power Giants* deliver the extra power you need to handle your hauling jobs faster, with less engine strain. Naturally, less strain means less wear, fewer repairs as you pile on the miles.

See proof for yourself. Certified results of all the comparison tests are in your Dodge dealer's showroom. Look them over and we think you'll be convinced that your next truck should be a Dodge.



DODGE and competitive trucks were tested for pulling power by towing a special dynamometer truck. Gauges measure maximum pulling force exerted. To convert this force into pounds, gauge reading is multiplied by three.



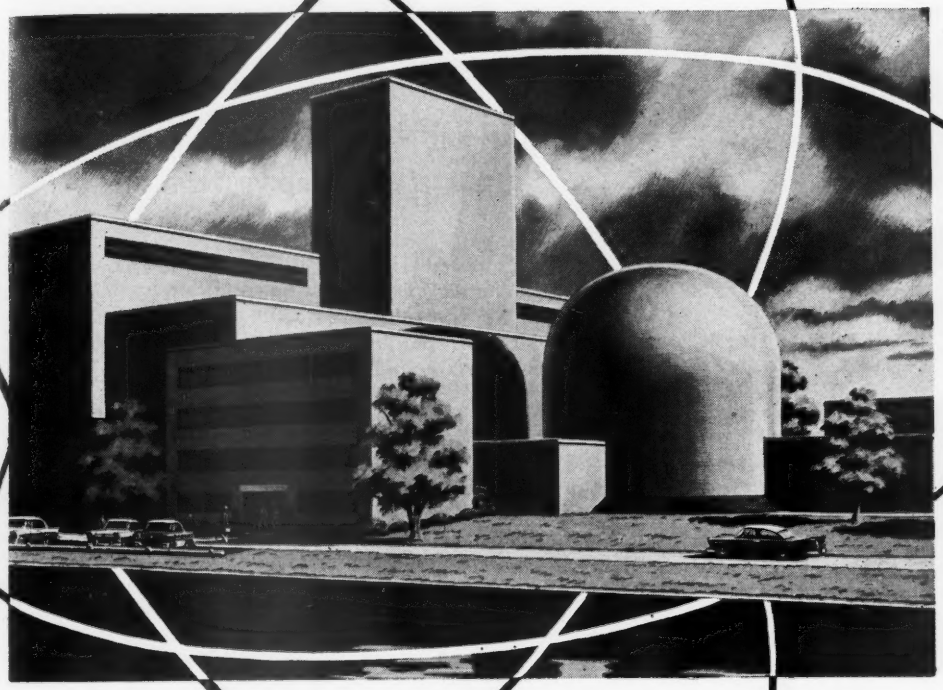
TRUCK C, pulling the same dynamometer truck as the Dodge, was unable to equal the Power Giant mark in repeated tries. Gauges show Dodge outpulled Truck C by 32%.

TRUCK F in its turn pitted all its pulling power against the Dodge, to no avail. The sealed, accurate gauges reveal clearly that Dodge offers most "pull power" of the low-priced 3.

DODGE

PowerGiants

MOST POWER OF THE LOW-PRICED



ENRICO FERMI ATOMIC POWER PLANT

100,000 Kw Capacity
Under Construction Near Monroe, Michigan
by
POWER REACTOR DEVELOPMENT COMPANY
and
THE DETROIT EDISON COMPANY

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Architect-Engineer for the Reactor Plant

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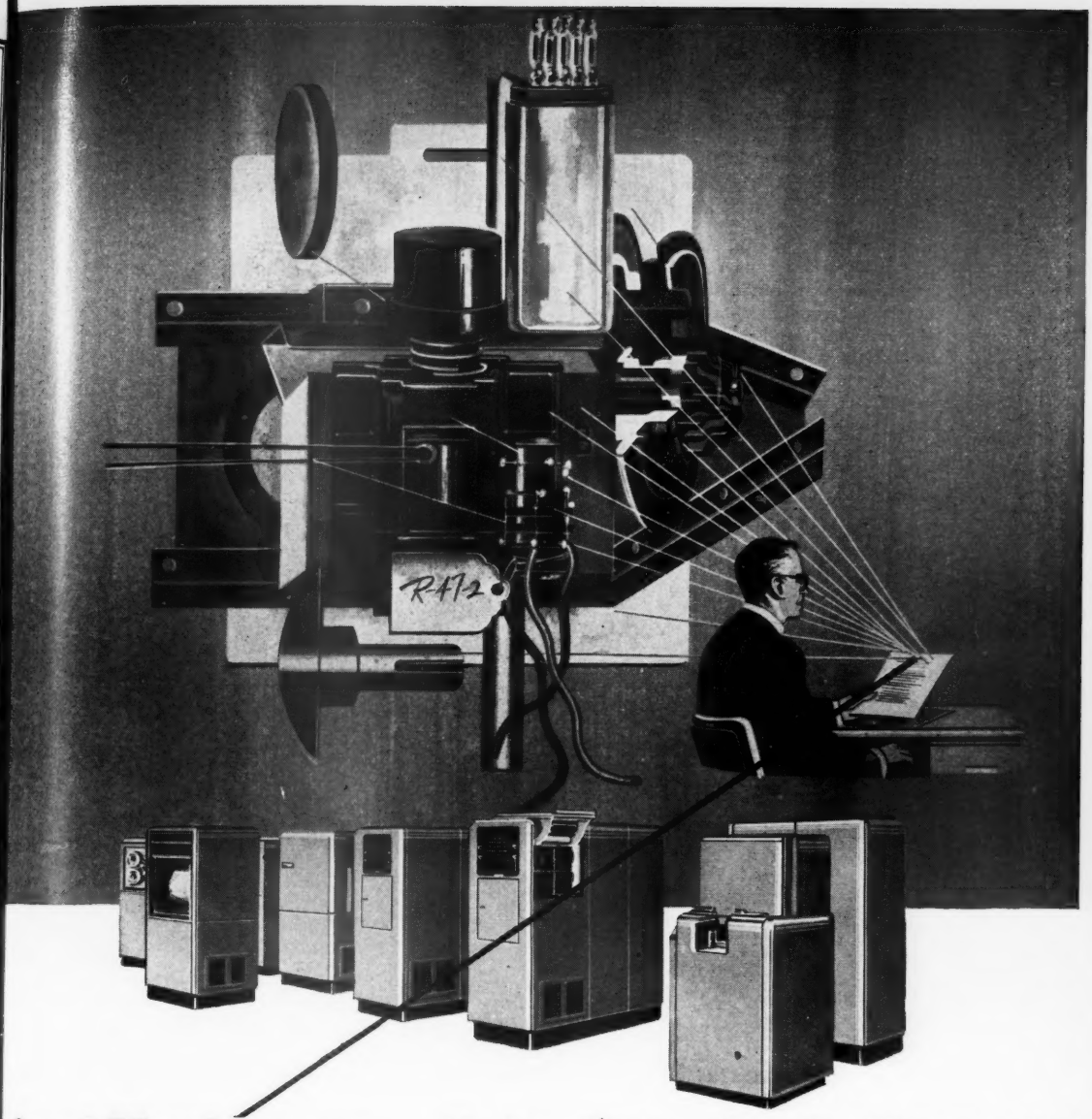

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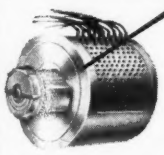

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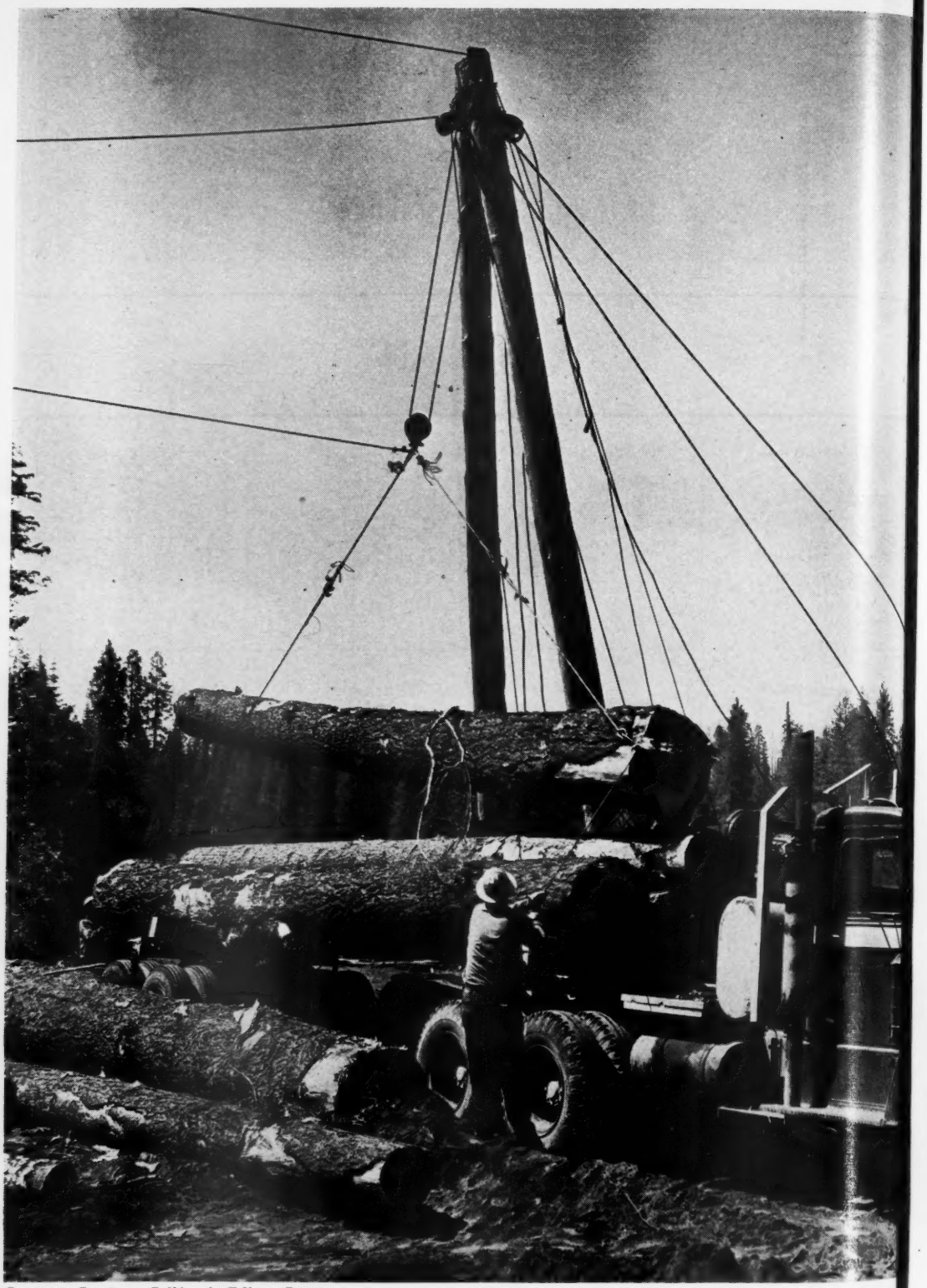
UTILITIES *A·l·m·a·n·a·c·k*

AUGUST

Thursday—1 *University of Michigan Engineering Summer Conferences will be held, Ann Arbor, Mich. Aug. 19-30.* ***Advance notice.***	**Friday—2** *Western Electronic Show and Convention will be held, San Francisco, Cal. Aug. 20-23.* ***Advance notice.***	**Saturday—3** *Alaska Independent Telephone Association will hold annual convention, Kodiak, Alaska. Aug. 26-28.* ***Advance notice.***	**Sunday—4** *Annual Appalachian Gas Measurement Short Course will be held, West Virginia University, Morgantown, W. Va. Aug. 26-28.* ***Advance notice.***
Monday—5 *American Institute of Electrical Engineers will hold Pacific general meeting, Yakima, Wash. Aug. 26-30.* ***Advance notice.***	**Tuesday—6** *Pacific Coast Gas Association will hold convention, San Francisco, Cal. Sept. 3-5.* ***Advance notice.***	**Wednesday—7** *American Water Works Association, Wisconsin Section, will hold annual meeting, Milwaukee, Wis. Sept. 4-6.* ***Advance notice.***	**Thursday—8** *Independent Natural Gas Association of America will hold annual meetong, Houston, Tex. Sept. 9, 10.* ***Advance notice.***
Friday—9 *American Gas Association will hold industrial gas school, Pittsburgh, Pa. Sept. 9-13.* ***Advance notice.***	**Saturday—10** *Illuminating Engineering Society will hold national technical conference, Atlanta, Ga. Sept. 9-13.* ***Advance notice.***	**Sunday—11** *Instrument Society of America will hold annual instrument automation conference and exhibit, Cleveland, Ohio. Sept. 9-13.* ***Advance notice.***	**Monday—12** *New England Gas Association will hold safety conference, Boston, Mass. Sept. 10.* ***Advance notice.***
Tuesday—13 *Mid-West Gas Association will hold gas school and conference, Iowa State College, Ames, Iowa. Sept. 10-12.* ***Advance notice.***	**Wednesday—14** *American Water Works Association, New York Section, will hold annual meeting, Upper Saranac Lake, N. Y. Sept. 11-13.* ***Advance notice.***	**Thursday—15** *National Petroleum Association will hold annual meeting, Atlantic City, N. J. Sept. 11-13.* ***Advance notice.***	**Friday—16** *Maryland Utilities Association will hold annual fall conference, Virginia Beach, Va. Sept. 13, 14.* ***Advance notice.***



Courtesy, Southern California Edison Company

Hauling Big Timber at Shaver Lake, California

High Sierra hydro plants are surrounded by 11,400 forest acres. *See article, page 165.*

Public Utilities
FORTNIGHTLY

VOL. 60, NO. 3 AUGUST 1, 1957

The Future of Solar Energy

During the second half of the twentieth century a shortage of fossil fuels promises to become a real problem of world economy. The best of the hydroelectric sites have already been developed and the economic utilization of atomic power is still an unknown quantity. Hence the continued interest in the possibility of using solar energy, which is the abundant and everlasting heritage of the entire world.

BY JOHN I. YELLOTT*

WE use energy in every aspect of our daily life, and we are so accustomed to using it in abundance that, like plentiful supplies of drinking water, we notice it only when it is suddenly absent. An automobile with gasoline and water tanks empty in the Mohave desert; a home without electricity or gas due to flood or wind—these are among our concepts of *absent* energy. We rarely give a thought to what will happen when our familiar energy sources are historical statistics rather than endless resources for the future.

The close relation between living standards and high rates of energy use is shown clearly by Figure 1, page 147. Mere possession of energy resources does not assure their owners of high living standards, for the inhabitants of the Near East principalities exist in arid poverty above their vast, but largely unused, oil sands.

Primitive civilizations such as those

* Executive director, Association for Applied Solar Energy, Phoenix, Arizona. For additional personal note, see "Pages with the Editors."

which exist even today throughout the Orient rely almost entirely on *income* energy, such as wood for fuel and animal or man power for work. Existence under these conditions is primarily subsistence, and life is a dawn-to-dusk struggle to obtain food and fuel to fight off hunger and cold. In the tropics, fuel for cooking and food to be cooked are usually more plentiful, but living standards are nearly as low in Siam as in Siberia.

WHEN western man found that steam and gasoline engines could do his work, plant and harvest his food, and give him freedom to travel, he began to use his capital supply of fossil fuels—coal, oil, and gas—in rapidly increasing amounts. Electric generation, made possible on a tremendous scale by the perfection of steam and hydro plants, gave freedom from needless drudgery in factory and farm as well as in home and office.

The energy history of the United States is significant, because other nations will probably follow at least a part of our path from an agrarian to an industrial economy. Our pioneer ancestors used energy in relatively meager amounts. In 1850, our great-grandparents used about 110 million heat units (Btu) apiece, of which about 93 per cent went to comfort heat, 3 per cent to process heat in foundries, distilleries, etc., and 4 per cent to work in steam engines and water wheels. Since 1850's population was only 23.2 million, the total energy need was equivalent only to about 100 million tons of coal. Actually, wood supplied more than 80 per cent of the energy, with water power and coal, both anthracite and bituminous, supplying the rest.

The next fifty years saw industry come to a nation which tripled its population and transferred its energy load from the renewable resources of water and wood to the *capital* supply of coal, oil, and natural gas. The automobile was still a very new and unreliable device, and since our parents had not yet developed a thirst for gasoline, the energy requirement per capita was still only 129 million Btu. In 1900, 376 million tons of coal would have supplied all of our energy needs. (Figure 2, page 148.)

THE first fifty years of the twentieth century have seen tremendous changes in our way of life. The most significant of those changes are derived from two factors—the unlimited availability of electricity and the prodigious production of automobiles. When Henry Ford put the gasoline engine on wheels and introduced it to mass production, he brought about changes in every aspect of our life, not the least of which was a change from complete reliance upon solid fuels (wood and coal) to dependence upon fluid fuels (oil and gas).

The first quarter of this century saw an engineering revolution which has gone almost unnoticed but which is extremely important to all of us. In 1900, virtually all of our electricity came from the burning of coal, and some *seven* pounds of it had to be consumed to generate each kilowatt-hour. By 1915, thanks largely to the ingenuity of the engineers who design and build steam power plants, the average fuel consumption had been cut in half; by 1925 it had been halved again. Today, less than one pound of coal or its equivalent in oil or gas must be burned to produce a kilowatt-hour at the great generating stations which supply us with our most important

commodity, electric power. (Figure 3, page 151.)

THE improvement in fuel consumption which remains to be accomplished cannot be as spectacular in the future as it was in the past, because nature imposes rigid restrictions on the efficiency of all of our devices. We have come close to that limit with the steam plants which are being built today, and tomorrow's tremendous demands for electricity will be met only by using more and more energy.

Today, each of us uses just about as much coal as our fathers needed in 1900, but, in addition, we use an equal amount of energy in the form of oil, and half as much again in the form of natural gas! Our per capita consumption of energy has more than doubled in the past fifty years, and the curve is still rising sharply. (Figure 4, page 151.) The only period during the past century which has seen a recession in the energy use curve was the depression at the end of the twenties, and it was coal which bore the brunt of that economic disaster.

As the other nations of the world emerge from the agricultural to the industrial stages of their development, they will to some extent follow our path. Only a few other sections of the world, however, have the abundant resources which were at our disposal. The uranium atom, rather than the coal mine or the oil well, will have to power the industrial revolutions which are still to come in the Far East.

ONLY a fortuneteller would try to foresee the shape of the things which are to come in the remainder of this century, but there are some predictions which seem

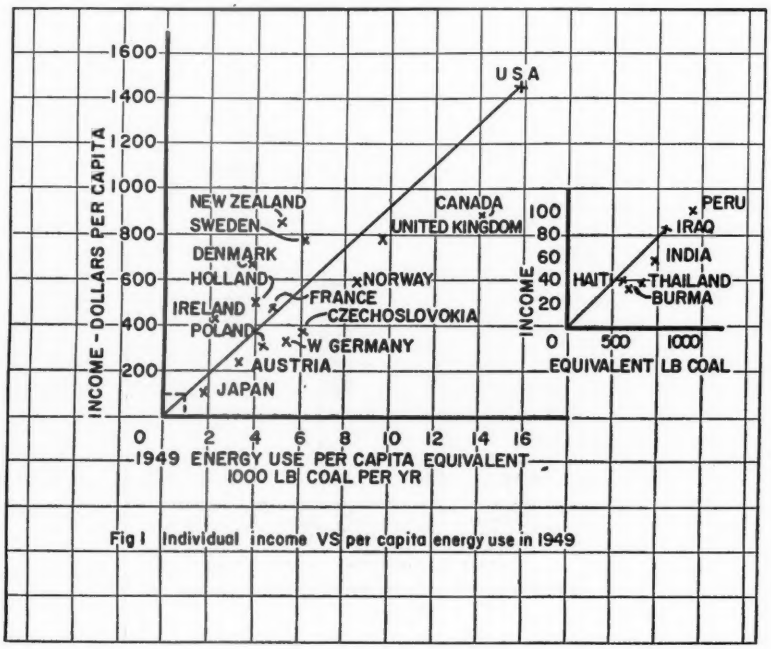


Fig 1 Individual income VS per capita energy use in 1949

to be reasonably safe. The first of these is population. By 1975, the United States will have a population of 225 to 230 million people. We will be confronted by the 3.2 *billion* who will be crowding the other nations of the world. The turn of the century will find this country inhabited by no less than 300 million, but our children will be outnumbered at least 16 to 1 by the 4.8 billion whom Asia, Africa, and Europe must shelter and feed.

The energy requirements of the United States in 1975 can be estimated by projecting today's data of population and per capita consumption. Two hundred and twenty-eight million people, using energy at a probable rate of 330 million Btu per year, will need 75 *billion* million Btu. Expressed mathematically, this is 75×10^{15}; in terms of fuel equivalents, this represents the heat which can be released by burning 2.8 billion tons of coal or 12.4 billion barrels of oil. Actually, it will probably be obtained from the three fossil fuels and atomic energy in about the following proportions: coal, 30 per cent; oil, 38 per cent; gas, 27 per cent; atomic, hydroelectric, and solar power, 5 per cent.

It is much more difficult to try to guess what will be happening in the world in the year 2000, because by that time the fossil fuels will have begun to be in short supply in many parts of the world just as is the case with coal today in Great Britain. If the present trends persist and per capita demands continue to rise as they now promise, the total consumption in the U. S. A. would be about 120×10^{15} Btu. This would be equivalent to 4.6 bil-

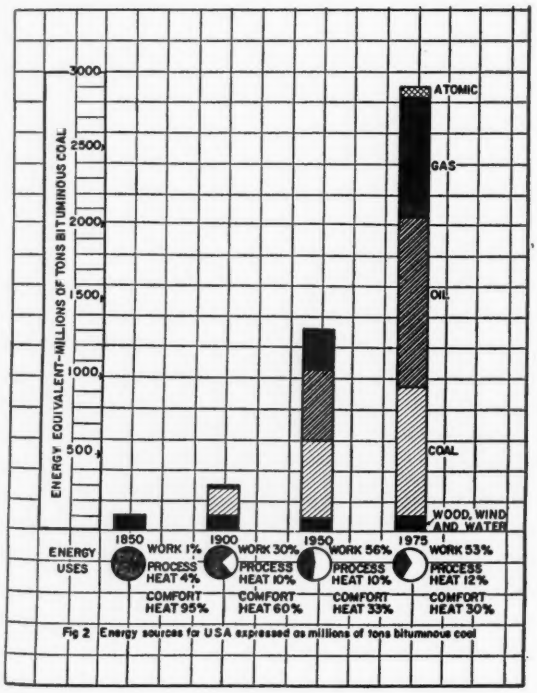
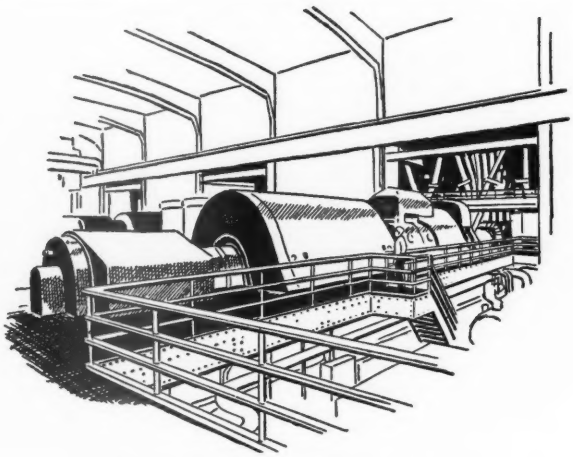


Fig 2 Energy sources for USA expressed as millions of tons bituminous coal



Engineering Revolution

"THE first quarter of this century saw an engineering revolution which has gone almost unnoticed but which is extremely important to all of us. In 1900, virtually all of our electricity came from the burning of coal, and some SEVEN *pounds of it had to be consumed to generate each kilowatt-hour. By 1915, thanks largely to the ingenuity of the engineers who design and build steam power plants, the average fuel consumption had been cut in half; by 1925 it had been halved again. Today, less than one pound of coal or its equivalent in oil or gas must be burned to produce a kilowatt-hour at the great generating stations which supply us with our most important commodity, electric power."*

lion tons of coal, or just about ten times as much as was mined in 1956. If oil and natural gas were to remain available at something like today's prices, about two-thirds of the energy demand in the year 2000 will be for the fluid fuels, and one-third for solid fuels and for all other forms of energy.

The situation in 1957 to some degree and in 2000 to a very marked degree will be determined by the availability of capital to exploit additional discoveries of the fluid fuels and the known reserves of coal. From what we can see today, the world's reserves of the fluid fuels, including those which can be won from such sources as oil shale and tar sands, may approach 11,000 x 10^{15} Btu. The United States, which is by far the largest user of fluid fuels, is not the most richly endowed with them, for we probably possess only a little more than 30 per cent of the total. We have something like 34 per cent of the known coal reserves, however. (Figure 5, page 153.)

Coal must provide the bulk of our en-

ergy during the last quarter of the present century, just as it did during the first quarter. The major difference will be the cost factor, because of the increasing distances between fuel sources and destinations. Mechanized mining will continue to raise the productivity of the miners, but the efforts of the coal producers to keep costs down will to some extent be nullified by rising freight rates and longer hauls.

No one knows just how much oil we shall be able to recover from the earth, but we do realize how completely dependent we are upon petroleum for all of our transportation as well as for all other uses of power. The availability of the fluid fuels will be largely a matter of how much we are willing to pay for them. The motorist will probably determine the answer to that question, for our oil output is largely tied to the gasoline market. The best authorities agree that we shall find large additional supplies of oil in and around this continent, but the cost of the necessary exploration and drilling will rise continually. The tremendous reserves of the Near East will have to supply the rapidly increasing demands of Europe and Asia, and our national security will be precarious indeed if we find ourselves dependent upon foreign sources for our essential liquid fuels.

Those same authorities agree that, despite exploration and ingenuity, the time is not far off when we must think seriously about other sources of energy to supplement both solid and fluid fuels. The development of atomic power will come none too soon to replace increasingly costly oil and gas as the principal energy source for the large generating stations of the West. Certain needs are not likely to be met by atomic energy, however. Among these are fuels for automobiles, locomotives, and aircraft, raw materials for steel and chemical production, and heat for individual homes. Let us take a look at this last requirement to see what part solar energy may be able to play.

When we consider the use of energy in the home, we realize immediately that most of the applications there are at relatively low temperature. The only really high temperatures are those of the filaments of incandescent lamps and the burners on kitchen ranges. The principal energy users today are the domestic hot water heater and the furnace which heats the home. The output of these two ingenious devices is actually used at temperatures between 110 and 150 degrees Fahrenheit, despite the fact that both of them burn fuels at much higher temperatures. In the Southwest, and increasingly in other parts of the country, air conditioning by refrigeration is becoming a major user of energy. Here again the temperature level is low although the energy bill is high!

At the present stage of our development, solar energy is valuable principally as a source of heat at temperatures below 200 degrees Fahrenheit. Electricity can be generated directly from sunlight by several types of solar batteries, but these are limited today to such small outputs that they are useful only for such applications as powering transistorized radios, etc. It is possible to produce power in units as large as several kilowatts but only at a cost which is far too high to be competitive with electricity generated by small gasoline or diesel engines. While such solar devices will be useful in those parts

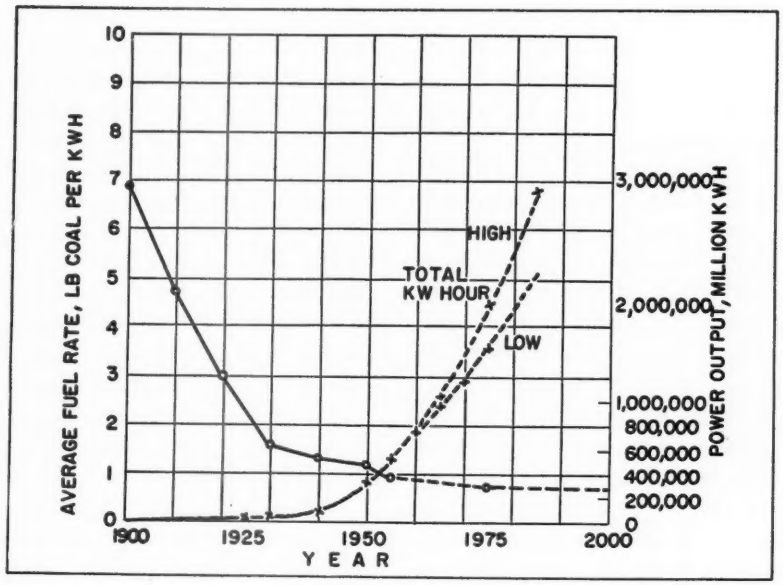


FIGURE 3—ELECTRICAL OUTPUT AND AVERAGE FUEL RATES, 1900 TO 1975

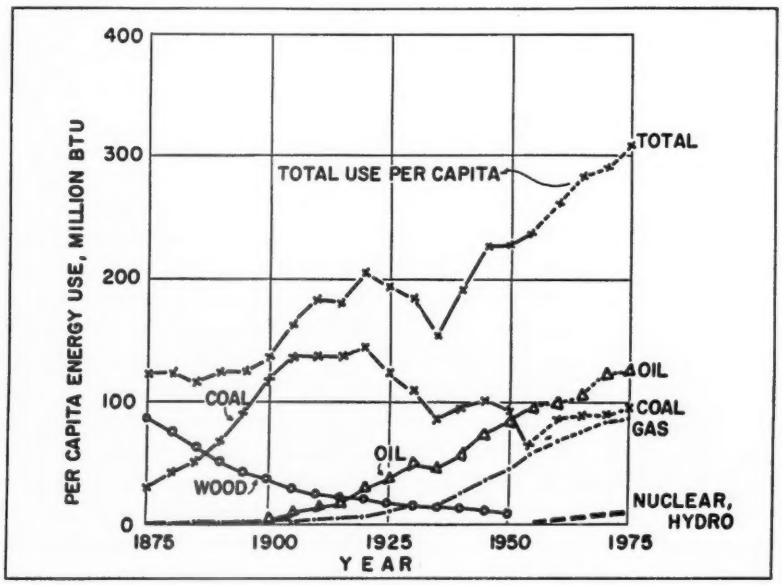


FIGURE 4—PER CAPITA ENERGY USE IN THE UNITED STATES

of the world where electric power has not yet penetrated, they will not solve our problem. The simple devices described in the following text will go far in that direction, however.

FIRST of all, let us take a look at solar energy to see what it is and how much we have available. The answers to these questions have been found for us by pure scientists who had but little interest in the mundane uses to which we propose to put some of the energy which we receive from the sun. We receive it in the form of radiation which is most intense in that portion of the spectrum which is visible to our eyes. Solar radiation, as it reaches the earth through the filtering layer of atmosphere, is quite harmless except for its ability to produce sunburn. Some of the radiation which reaches our atmosphere is absorbed to warm the air around us, and some is reflected back into outer space by clouds, but, on the average, about two-thirds of the energy reaches the earth's surface.

Because our planet Earth spins about an axis which is tilted with respect to the rest of our solar system, we find that the sunlight reaches us through a much thicker layer of atmosphere in winter than it does in summer. Summer days are longer than those in winter and these two effects combine to give us about twice as much solar radiation on June 21st as on December 21st. Cloudiness is another extremely important influence which must be taken into consideration when practical applications of solar energy are being studied.

THE Weather Bureau has determined the availability of solar energy throughout the nation, and the experts in the climatological section have produced maps which show how much solar energy may be expected at any particular location. On the average, the sunny Southwest receives the most intense radiation, which amounts to as much as 2,600 Btu per square foot of surface on a summer day. When clouds do not intervene, the northern parts of the country do almost as well, for their summer daily share may be as high as 1,850 to 2,000 Btu per square foot. The significance of this nearly equal summer distribution lies in the fact that air conditioning, now recognized as a necessity in most parts of the country, can be accomplished by solar energy wherever there is enough unobstructed roof area to absorb it.

The winter situation is quite another matter, because the states in the southern tier receive considerably more than twice as much solar energy as those along the Canadian border. In addition, the heating load in the northern states is five to six times as great as it is in the Southwest.

THE energy which we receive from the sun manifests itself as heat. If we concentrate a large area of sunlight onto a small spot, as we do in the solar furnace, extremely high temperatures can be obtained. When the same amount of radiation falls upon a flat surface, the moderate temperatures which result are familiar to us all. Fortunately, those temperatures are high enough to supply most of the energy which we need in our homes. Fortunately, too, the total amount of energy which we can collect from our roof tops during the daylight hours is large enough to supply many of our needs throughout the night as well. For example, a house with 1,600

square feet of roof area can collect nearly two million Btu per day in the Southwest and half that much even in the cloudy Great Lakes region. This is equivalent to the heat which would be released by burning 1,000 to 2,000 cubic feet of natural gas. Converted to electricity at an efficiency of only 10 per cent, 30 to 60 kilowatt-hours would result, which is far more than the average household uses today.

To allay the fears which this possibility may arouse in the utility industry, we must add that we still do not know how to convert this "free" energy into electricity at a cost which is even remotely competitive with power from conventional fuels. We *do* know, however, how to collect and use solar energy in the form of heat, and it is in this form that it will be most useful to us in the immediate future.

We have seen in the preceding section that most of the energy which we use to "comfortize" our living quarters is expended at relatively low temperature. Let us look at the possibility of doing this with solar energy instead of with fuels. The device which we shall use is the flat-plate collector, one form of which is shown in Figure 6, page 155. It consists of three essential elements: the transparent cover; the heat absorbing and transferring surface; the insulation. The cover allows the sun's rays to fall upon the heat absorber, but it acts as a "heat trap" to prevent the absorbed energy from being lost to the surrounding atmosphere. The collector plate absorbs a high percentage of the solar radiation which falls upon it,

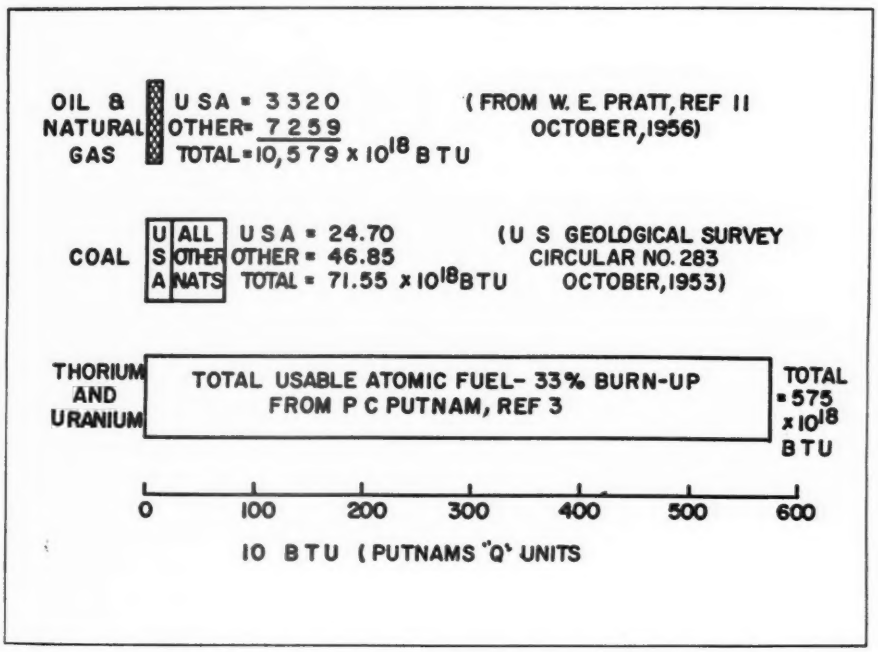


FIGURE 5—ESTIMATED WORLD FUEL RESERVES

and transmits that energy to the fluid flowing through the tubes which are attached to or integral with the plate. The insulation prevents the collected heat from being dissipated uselessly from the back of the collector.

The ability of this simple device to do a useful job of collecting the sun's energy has been known for well over a hundred years, and many of them have been built in the sunny regions of the world. New developments have reduced the cost of such collectors to the point where they are now beginning to become competitive with conventional fuels. Instead of glass, which is expensive and breakable, we can now use plastic films for the cover sheets with a substantial reduction in cost. New techniques have been developed by which the tube and the sheet of the collector plate can be made integral, thus eliminating the need for laboriously fastening separate tubes to sheets of copper or aluminum. Inexpensive reflective insulation may be used to minimize loss of heat from the back of the plate. The net result of these developments is the availability of collectors at 60 cents to 75 cents per square foot, instead of $3 to $4.

THE operation of flat-plate collectors is extremely simple. Water or some other suitable fluid is pumped through the tubes, thus carrying away the collected energy and transporting it to a storage system, from which it can be drawn as it is needed. Storage is obviously a prime necessity in a solar heating system, because the sun is certain to set each afternoon, and is very likely to be obscured by clouds at inconvenient times. Energy storage is still largely an unsolved problem, for we have not found a really good way to store up mechanical power in large amounts. Springs, lead or nickel cells, and water in elevated tanks are the familiar devices for storing energy. Certain chemical materials can absorb and give off heat as they change from solid to liquid states, and the temperature at which they do so may be varied over quite a wide range. None of these methods is the last word on the subject, however.

In most parts of the world, some supplementary source of energy is needed to take care of protracted sunless periods. One of the most useful devices for this purpose is the heat pump (Figure 7, page 155), which is simply a refrigerating system used to pump heat into a space which needs to be warmed instead of performing the more usual function of pumping heat out of a space which needs to be cooled. Heat pumps are now beginning to be used in many parts of the country to heat in the winter and to cool in the summer. Until we develop a simple method of cooling with the solar energy collected in the flat-plate collectors which do the winter heating job, the heat pump is likely to remain a very important adjunct to solar "comfortizing" systems.

MANY different systems for heating by solar energy have been tried in the United States and abroad. In addition to the water system outlined above, air systems have been used with rock piles as the storage means. These have the advantage of eliminating the problems of leakage, rust or corrosion, and freezing, but they require large ducts instead of small pipes.

The flat-plate collector shown in Figure 6 is a versatile device which is not too particular about the angle at which it is erected. If it is to be used primarily for

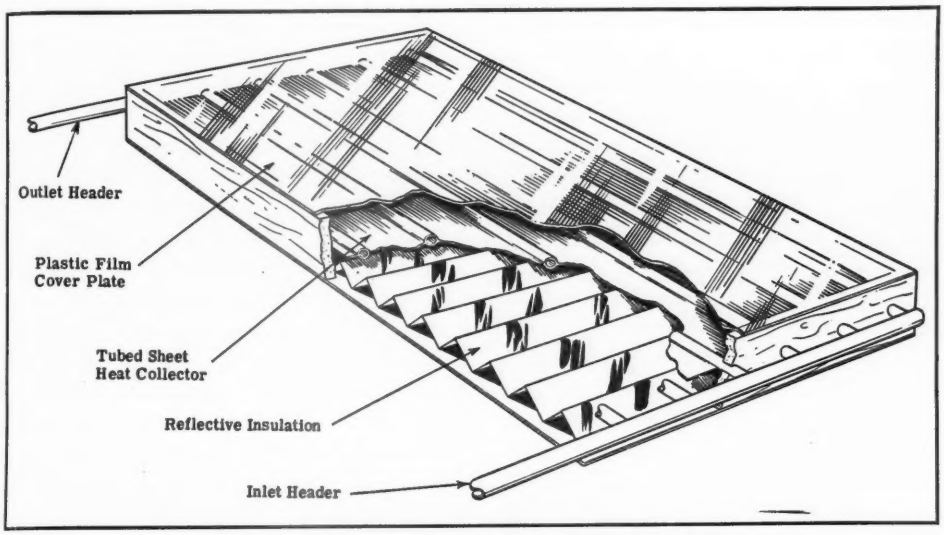


FIGURE 6—MODERN FLAT-PLATE COLLECTOR

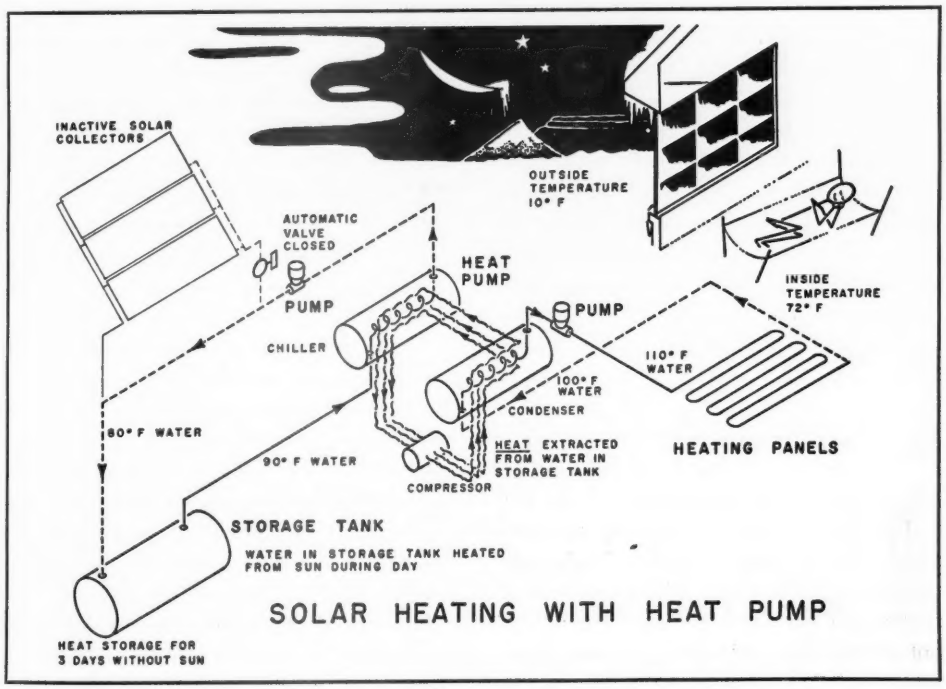


FIGURE 7—SOLAR HEATING SYSTEM USING HEAT PUMP AS AUXILIARY SUPPLY

winter heating, it should look as nearly as possible directly at the sun at noon on December 21st. An inclined collector will pick up as much as 60 per cent more heat in winter than one which is horizontal. If the purpose of the collector is to supply heat to an absorption refrigeration system during the summer, a smaller angle of inclination is preferable.

To summarize the comfort energy situation, the combination of solar heat collection and storage apparatus with a supplementary energy source such as a heat pump can do the "comfortizing" which residences require in most of the United States. A significant saving in total fuel consumption can be accomplished by this combination. The economic aspects of the "comfortization" picture will be considerably more favorable when solar refrigeration apparatus becomes available.

Large multiple residences, such as apartments, which have a small roof area in proportion to their number of inhabitants, are not likely to benefit materially from solar energy. Try as we may, there is no way of collecting more energy per square foot of surface than nature delivers to the earth, and solar radiation is inherently diffuse. There are several other beneficial aspects which should be mentioned, however.

WE have already seen how the growing population of our world is going to make increasingly severe demands on our fuel resources. Another natural resource which will be more and more inadequate to our needs is water. Three-quarters of the world's surface is covered with it, but not of the variety which we can use. Eventually, we shall have to find a way to obtain our principal supplies of irrigation and industrial water from the sea, since there is no possibility of obtaining enough from our rivers and lakes and our subsurface supplies.

Great strides have been made in recent years in reducing the cost of solar stills for desalting sea water. The principle by which they operate is essentially similar to the heat-trap action which enables the flat-plate collector to catch the sun's radiation. A thin transparent film forms the cover through which the sun's rays enter the device. A thin layer of salt water covers the blackened bottom of the still, which is heated by the solar radiation. The water is warmed and some of it evaporates, with the vapor rising and condensing on the cooler underside of the cover. The condensate trickles down into a discharge trough, which leads it to a suitable receptacle. The brine which remains behind may be dumped back into the sea, or it may be utilized as a raw material to recover the elements which it contains.

THE first cost of solar stills has been reduced to the point where a cost as low as 50 cents per thousand gallons is envisioned for potable water. This is still far too high for irrigation, but it is not out of line with present-day costs for drinking water for humans or animals.

The sea, which will be our ultimate source of water and minerals, may also be our source of fuel, for hydrogen and oxygen can be obtained by dissociating the water molecule. Plants know how to do this by the process which is called photosynthesis. By the aid of sunlight and chlorophyll, plants combine carbon dioxide and water into compounds which can be burned to release useful heat. We have other processes by which carbon, hydro-

gen, and oxygen can be combined to yield every kind of material from butter to gasoline, but the main difficulty is obtaining the hydrogen and oxygen at a cost which is low enough to make the process pay for itself. Progress has been made in causing sunlight to produce the two essential gases from sea water with the aid of a catalyst, and there is reason to hope that the process may one day become economically useful.

ENERGY to maintain our grandchildren in the manner to which we have become accustomed is not going to come from the same reserves of fossil fuels upon which we and our children will draw. The fluid fuels will be depleted to the point where their price will rise significantly, and we shall find more and more of our energy coming to us by electric wires running to gigantic generating stations. These will be run on coal and then on nuclear fuels. Energy for doing the low-temperature chores such as water heating and the cooling and heating of our living quarters will become a matter of considerable urgency, and it is in this area that we will find the first widely used applications of solar energy.

SOLAR collectors can take care of the space and water-heating requirements for single-family residences in much of the United States, provided that storage means and a supplementary energy supply are available. The heat pump, deriving its power from the utility system and upgrading the heat collected from the sun, will be used much more widely as a solution to the "comfortizing" problem. Since summer cooling is now regarded as essential in a considerable part of the United States, the heat pump is a good solution to the year-around problem when solar collectors are used as heat supplies.

Eventually, absorption or other chemical refrigeration systems will be used with the same solar collectors which do the winter heating and then the fixed charges on the equipment can be spread over the entire year. Intensive research is needed now to develop the equipment which will make this possible.

PEACETIME *economic controls enforced by a centralized bureaucracy were decried by Senator Knowland (Republican, California) in a recent address at Richmond, Virginia. The Senate Minority Leader stated: "It is my strong belief that this nation . . . is too large geographically and too complex economically to be either effectively or efficiently run by any group in Washington. If we ever let our economy slip under such controls in peacetime we may not get out from under them again in our lifetime." Such prolonged controls would bring about a vast concentration of bureaucratic power and "have the gravest type of repercussions on our constitutional system." Knowland called for voluntary efforts to combat inflation and asked for the support of all groups, individuals, and organizations to reduce nonessential federal spending, thereby paving the way for possible tax reductions. He declared: "Frankly, I do not subscribe to the theory that if individuals or business organizations spend their own earnings it is inflationary whereas if the government takes it from them and spends it that is not inflationary."*

Rural Load Development through United Co-operation

Three years ago former REA Administrator Ancher Nelsen invited members of the electric utility industry, both business-managed companies and REA co-operatives, along with equipment manufacturers and agricultural experts, to a joint meeting on the subject of farm utilization of electricity. Out of this meeting grew the Inter-Industry Farm Electric Utilization Council.

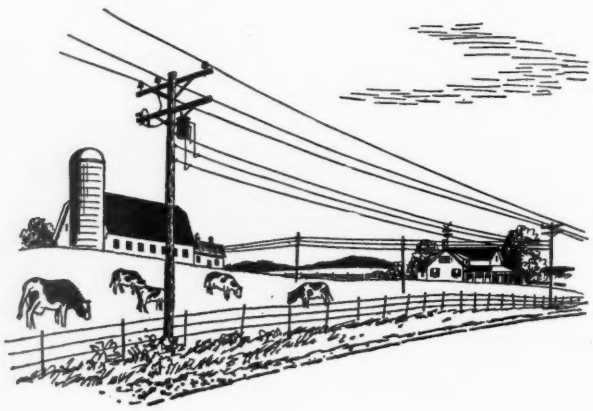
By GUY W. THOMAS*
VICE PRESIDENT, PUBLIC SERVICE COMPANY OF COLORADO

SOME twenty years ago, the task of electrifying the nation's rural areas had just begun. At that time, it was estimated that barely one per cent of these areas had access to central station electric power. Today, that job has been about 95 per cent completed. The job that lies before all segments of the electric industry today is even more challenging—that of helping the farmer make the most effective use of the electric energy and equipment that is now available to him, in order to increase his productivity, his profits, and his standard of living. This, then, is how that help is beginning to take shape.

*For additional personal note, see "Pages with the Editors."

In March, 1954, the then REA Administrator, Ancher Nelsen, invited members of electric systems, both co-operative and private, serving rural areas, along with electrical equipment manufacturers, agricultural agency representatives, and farm publication editors to a joint meeting in Chicago, Illinois. The purpose of this conference was to discuss combined all-industry effort to expand and improve farm use of electricity. The result of the meeting was the formation of the Inter-Industry Farm Electric Utilization Council—a group to provide the leadership to achieve this end.

In the fall of 1954, a series of area meetings sponsored by this organization



were held in five different places throughout the nation. One, the western area conference, was called in Denver, Colorado, on September 28th. In attendance at this meeting were over 370 men, representing nearly every phase of the electric industry from 12 western states and Alaska. From this meeting the beginnings of various individual state organizations were formed, one of which was the Colorado Farm Power Council.

Less than three weeks after the general meeting, a steering committee, consisting of a representative from private and co-operative power suppliers, manufacturing and distributing concerns, and one member of the Colorado A&M College Extension Service, had drawn up tentative plans for the formation of a statewide organization in Colorado. A general meeting of all persons and firms expressing an interest was called for October 15, 1954. At that meeting, seventeen members were in attendance and, by the end of the day, the rudiments of the Colorado Farm Power Council organization had been established.

The initial organization of the Colorado Farm Power Council is as yet relatively unchanged. It consists of a board of directors and standing committees devoting their time to sales promotion, publicity, and research and information.

The board of directors consists of twelve men, seven from power suppliers, broken down further to include five REA members and three private utility representatives and four representatives from manufacturers and distributors. The three ex officio members of the board are a member of the Colorado A&M College Extension Service, the REA field representative, and the past president of the board of directors.

The work of these three committees provides the impetus that maintains this young, ambitious organization. And while the problems of trying to create on organized effort in a field that has for years been a matter of individual concern are oftentimes insurmountable, the men on these committees have made considerable progress.

One of the more successful activities the council has promoted among the rural population seems to have proved its worth in one summer's operation. That one is the CFPC demonstrators' pool. The council was quick to recognize that home demonstration of electric appliances is one of the best ways to promote their use on the farm and in rural areas. To back up this theory, two home economics students from Colorado A&M were employed during the summer months last year to travel into the rural areas of the state and demonstrate electric ranges and freezers. These home economists were employed by the CFPC and their services made available at a flat rate per week to any power supplier or others who wished to sponsor range or freezer demonstrations.

Before their actual demonstrations, the girls spent some time with the local power suppliers, polishing up their demonstration techniques. Here, the co-operative efforts of not only the members of the council as a whole but of the different committees within the organization were put to their first real test.

After the demonstrators' indoctrination, it was necessary to publicize the proposed gatherings. The council's publicity committee would furnish any community or

organization with advance publicity, including pictures of the girls, their complete itinerary, and an introductory letter telling of the girls' backgrounds and qualifications. Recipe sheets were also sent to the power supplier in the area for duplication and distribution to the audiences gathered for the demonstrations.

The success of these meetings and demonstrations is backed up by the 3,000 persons who attended them during their fifteen weeks of showings last summer—an average of over 200 per week. Requests have already been received for similar demonstrations during the coming summer.

Edward Gaither, general manager of the San Isabel Electric Association, expressed the feelings of most of the power suppliers when he said, "We feel that probably the most outstanding accomplishment of the council has been the inauguration of the demonstration pool. Every power supplier that has used it is well pleased with the results."

JOINT sponsorship of the demonstration programs by the local utility and REA was frequently arranged where the operating service areas were adjacent. Definite arrangements were being made to duplicate the activity this summer. The demonstration pool, technically, falls under the jurisdiction of the sales and promotion and publicity committees, but was heartily endorsed by the entire council. One offshoot of the girls' demonstrations that possibly was not planned on initially was that some of the power suppliers that witnessed the demonstrations and the success they achieved are seriously considering employing a full-time home economist.

Other activities of these two committees in the history of the council have been concerned with efforts to acquaint the members with various campaigns being conducted nationally on various promotions. Electric bedding and dryer campaigns have been very successful. Another source of information concerning activities of other state organizations is provided council members by these committees also.

THE promotional campaigns, necessarily, require the close co-operation of the appliance and equipment manufacturers and distributors. For example, range and water-heater promotions were aided considerably by arrangements whereby distributors and dealers offered special prices, trade-ins, free installation, etc.

Regular mailings on information re-

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garding home lighting, rewiring, farm electrification, and major appliance promotions are constantly being offered members. Another major activity of the publicity committee in conjunction with the others is arranging for space and display materials for local expositions.

SINCE its organization, three local electrical shows were held in conjunction with the Colorado Farm Power Council. The first was in the small eastern Colorado community of Flagler. Distributors and dealers were contacted regarding displays, a cooking school was conducted by a CFPC representative, and a home economist was on hand from Colorado A&M to offer her services. CFPC allocated a specified amount of its funds to help defray the cost, provided the local REA would match this amount.

The two-day affair was replete with parades, barbecues, baseball games, and a street dance. The fine dealer co-operation resulted in the council's being able to obtain a mobile display truck from a major appliance manufacturer. Included in this exhibit was a complete irrigation pumping display which, in this area of dry-land farming, is so important.

The affair was well publicized and arrangements were made with KOA Radio in Denver to have some of their personalities on hand to act as masters of ceremonies and special entertainment talent. As many as 1,100 people attended the appliance portion of the show, 400 at the cooking school and nearly 700 at the 4-H talent show.

THE second such show was held in co-operation with the Mountain View Electric Association in Limon, Colorado, a small rural town in the eastern part of the state. Publicity arrangements were similar to those at Flagler and 14 display booths were set up. Eleven of these were sponsored by local dealers. The first day, over 1,500 people attended the show.

As a result, Limon electrical dealers reported a definite upsurge in appliance sales due directly to the show. Needless to say, they were most enthusiastic.

THE third show of this type was held later in June, 1956, at Steamboat Springs, a progressive mountain community in northern Colorado. The show was staged in conjunction with the Yampa Valley Electric Association's dedication of its new headquarters and Colorado's lieutenant governor, now governor, Stephen McNichols, was the guest speaker. Over 4,000 people attended this show.

The power supplier of the area was again genuinely appreciative of the efforts of the council. In a letter to the council, it was stated:

> It is the feeling of the board of directors, L. G. Stukey, manager, and the power use adviser, Everette Chesney, that it would have been impossible for our association to have put on a show without the help of the Colorado Farm Power Council. We feel that our membership in the Colorado Farm Power Council was well returned to us through the co-operation of the CFPC in our electric show.

Because of the success these various shows have enjoyed in the past, the council will offer such support to power suppliers and dealers throughout the state to help show the way for such co-ordinated promotions.

Testing a Young Organization

"WHILE still a young organization, experiencing all the problems an organization of its type must go through, it is providing a service to the area's rural population that in the years to come will prove invaluable. . . . The Colorado Farm Power Council seems determined to build a permanent organization based on mutual benefit and a common purpose. They are convinced there are many things that they can do better together than they could do separately. The council has found and will continue to find that by keeping this goal in mind, the varied views and interests involved in the council can be joined for the benefit of everyone involved."

WHILE these are some of the more dramatic and obvious accomplishments of the council, others, while less noticeable, are making a great contribution to the welfare of the Colorado rancher and farmer. The majority of these activities are concerned primarily with the betterment of methods employed by rural Coloradans. These functions are under the supervision of probably the busiest of the three committees that make up the CFPC —the research and information committee.

It is the prime duty of the group to initiate, co-ordinate, and distribute information pertaining to tests and projects vital to farm life. In the two and a half years of the Colorado Farm Power Council's existence, this committee, in close co-operation with the agricultural extension service of Colorado A&M College in Fort Collins, has been instrumental in providing the farmers of the area with a number of clinically tested experiments designed to increase the farmer's production with proper use of electricity.

THE committee now consists of eleven men—two from the college, four from public utility companies serving rural areas, and five from rural electric co-operatives.

Before the actual field work of the com-

mittee was attempted, a number of articles and other test results were mailed by the committee to members of the council. In these mailings, such subjects as home lighting, youth sales activities, and egg cooling were discussed. At present, however, one of the more important activities of the group concerns actual field tests on electrical equipment and use of electricity around the farm. The results have been very gratifying.

ONE of the early studies completed by the group was an extensive survey of home freezers and their relative efficiency on the farm. Two-dozen makes of home freezers were checked in various ways—how much power they used—where they were kept in the home—whether they operated more efficiently full or nearly empty—even cold air studies with upright or horizontal type chests. The results proved very beneficial to the area's farm population.

This freezer test was one of four early field checks. The others included more extensive surveys on egg cooling, stock watering, and the growing potential of electric house heating.

A highly successful series of meetings throughout the state were held in conjunction with the Bussman Manufacturing Company. Bearing the auspicious title of "Selecting Protective Devices for Electric Motors, Circuits, Appliances, and Apparatus," the meetings were held in nearly every section of the state to large groups of farm electrical technicians, power suppliers, and county agents.

An activity of the council, under the direction of this committee and completed in its first phase a short time ago, was a series of irrigation clinics for technical people in the irrigation field. In an area where recent dry years have been nearly disastrous for the farmer, this subject carried added impetus.

The meetings were held in four locations and lasted for two days each. Their purpose was stated to be threefold. First, to become better acquainted with new irrigation development, methods, ideas, and equipment. Second, to create better understanding of the program and activities of both private enterprises and public agencies engaged in water development. Finally, to become better acquainted with each other.

Representatives from the Bureau of Reclamation, bankers, well contractors and equipment dealers, Farmer's Home Administration, cement firms, REA's and private utilities, soil conservationists, and people from the U. S. Geological Survey were invited to attend.

THE results of the meetings can probably best be summed up by F. N. Jordan, state supervisor for co-operative programs, Colorado A&M, when he said, "The recent series of irrigation workshops, in co-operation with the agricultural college, has enabled all groups in the industry to agree upon recommendations and has prepared the way for carrying a well-balanced educational program to farm irrigators."

His beliefs are seconded by another member of Colorado A&M, Floyd E. Brown, extension irrigation specialist. Mr. Brown says, "We had what I consider excellent attendance, with more than 90 per cent of those attending being technicians or people who work with farmers. I feel we fully accomplished the purposes of the program. The clinics were actually a kind

of leader training device. I'm sure those who attended gained some information and inspiration which will be valuable to them in their future contacts with the farmers."

The council and Colorado A&M Extension Service hope that a similar type of irrigation program can be carried directly to the farmer and tentative plans for such a series are now in the process of being formed. The entire series was another co-operative program between private power suppliers and rural co-operatives.

An important electric clinic, scheduled for June of this year at Colorado A&M, involving all of the state's high school vocational agriculture instructors, was designed to further cement the needed co-operation of these people and the council and to increase their knowledge of the practical application of electricity on the farm. The meeting was a three-day affair and covered a variety of subjects dealing with the use of electricity on the farm. A manual on the subjects has been prepared and was to be distributed to the instructors for their future use.

These, then, are some of the major activities the council is engaging in continuously. While still a young organization, experiencing all the problems an organization of its type must go through, it is providing a service to the area's rural population that in the years to come will prove invaluable. And in the midst of growing, the council should receive a shot in the arm next fall when the parent organization, the Inter-Industry Farm Electric Utilization Council, holds its Annual National Power Use Workshop in Denver.

The Colorado Farm Power Council seems determined to build a permanent organization based on mutual benefit and a common purpose. They are convinced there are many things that they can do better together than they could do separately. The council has found and will continue to find that by keeping this goal in mind, the varied views and interests involved in the council can be joined for the benefit of everyone involved.

Demand for Federal Activity

"I was *first naïve enough to believe it (the demand for federal power development) was because they (promoters of federal power development) were opposed to private enterprise in the utility field, but I am now beginning to discover their opposition to private enterprise. It is opposition to any nonfederal activity, whether it be by a municipality, a public power district, a public utility district, or even by a sovereign state. . . . The longer the controversy continues, the more clear it becomes that some of these people will be satisfied with nothing less than a complete federal monopoly of the field of natural resources, including not only hydroelectric power but timber, mining on public lands, and the federal control of irrigation through the assertion of paramount federal rights to the water."*

—Clarence A. Davis,
Former Under Secretary, Department of the Interior.

Utilities Find Forestry Pays Dividends

Upper Peninsula Power Company in northern Michigan started eight years ago what has come to be known as a "tree farm," and put 45,000 acres of timberlands under the management of professional foresters. Southern California Edison is another utility company which has gone in for forestry. Here is a report on this interesting innovation of utility company practice.

By JAMES H. COLLINS*

In one way or another, power companies, in one of the oldest industries, may find themselves engaged in forestry, which is a new industry of impressive proportions.

Hydroelectric plants often involve utility ownership of large areas in the back country. A power company may have industrial customers using lumber, and find it advantageous to go into production of their raw material. Forestry projects are being undertaken to fight soil erosion—and so forth. Looking into forestry as a business, for the first time, utility executives may be astonished by its standing as a new factor in our economy, and its possibilities for profit and the making of friends.

Eight years ago, with 45,000 acres of timberlands, the Upper Peninsula Power Company, in northern Michigan, put them under the management of professional foresters. Within six years these lands had been brought to standards of efficiency that won the certification of "tree farm," in the national system maintained by the

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American Forest Products Industries, an organization formed sixteen years ago to promote forestry as an industry. Its membership includes many utility companies.

The people in upper Michigan live by lumbering, wood industries, and tourists; also mining. Their forests supply materials for paper and pulp mills, wood treating and wood chemical plants, sawmills, plywood and veneer. Summer brings them campers, fishermen, and motorists, and autumn the hunters.

More than half the inhabitants of the peninsula are customers of the power company, 150,000 of them, and these are naturally the largest customers, furnishing employment to others. John H. Warden, president of the company, is also chairman of the peninsula's industrial development bureau, and the forestry project was prompted by several considerations.

First, timber being the basic material of his best power customers, it was to everybody's interest to increase production in quality as well as quantity, and to insure a continued supply for the future, by growing trees as a crop.

Second, more than a million acres of woodlands on upper peninsula farms and private properties might improve production, and be more profitable, by modern management methods. The company project would be a permanent demonstration of such methods. More than 60 per cent of U. S. certified tree farms are under 600 acres.

Third, the forests could be made attractive to tourists for camping, picnicking, fishing, and hunting.

Finally, well-managed forests are profitable, producing materials that find a ready market. Trees grown as crops are thinned and weeded to allow good timber to reach maturity faster; inflammable litter is cleared away; firebreaks are plowed; foresters mark mature trees for cutting at the top of their quality, for lumber, pulpwood, posts, ties, farm buildings, and fuel.

Last year, more than 10,000 tourists enjoyed the facilities provided at three popular recreation sites on company property. At Bond Falls a camping and picnic area is leased to a camp operator who conducts a small store with a restaurant, with picnic tables, free firewood, camp stoves, piped running water, playgrounds, and horseshoe courts. Agate Falls on the Ontonagon river is a mecca for fishermen, angling for rainbow trout, and a private company provides tourist facilities along the river. At Prickett Reservoir the company and Michigan conservation department provide fishing and boating. Logging roads are popular with hunters and hikers. There are 150 miles of them, and more than 1,000 miles of power line right of way, much used for deer and partridge hunting. More than 200 bucks were killed last year, with ducks, rabbits, and partridges.

Visitors see modern forestry work going on at various seasons. In the spring there is tree planting; 50,000 seedlings last season. Fire-scarred areas and abandoned farm lands are restored to timber production. Company foresters cruise and map timber to determine where logging is to be done, and specify cutting practices to insure continuous crops of timber. The company does no logging—

timber is sold on a stumpage basis, as it stands in the woods, and is cut and taken out by the buyers. Saw logs, pulpwood, plywood and veneer logs, poles, ties, posts, and other products roll out along the logging roads, raw material for the diversified industries in nearby communities.

An older forestry project, with a different objective, is that of the Duke Power Company, in North Carolina, which became interested in conservation during the late 1930's, and in 1939 established a forestry department to manage its lands for watershed protection against erosion. These particulars are given by Carl Blades, the company's chief forester.

The Catawba river, developed by the company for water power, carried a heavy silt load. Steam plants were replacing hydro at that time, but it was seen that silting up would soon end the company's water-power resources, unless something was done. Apart from the company's interests, management recognized its public responsibility to preserve the land for future generations.

To stop active erosion on 225,000 acres of company lands was the first job. Most of it is rolling, and lies along river courses. Tenants had farmed it until practically the whole top layer of fertile soil had been washed away. In 1940, 18,000 acres of this land was taken from farming and planted with 18 million pine seedlings. Another 5,000 acres were reseeded by natural means. Trees almost immediately stabilized the soil and started rebuilding topsoil, and with each year the land becomes more productive and valuable. The land was very poor at planting, but in 1953 the first tree thinnings were made, and in twelve seasons 30 cords of pulpwood per acre were taken out, yielding $90 per acre, and leaving the standing timber in better shape.

BESIDES tree planting, old stands of timber are being managed to help control the flow of water into company lakes. The region also has timber-using industries, and since 1940 the company has supplied them with approximately 130 million board feet of lumber, and 225,000 cords of pulpwood. Growth of timber is much greater today, as good trees mature.

To protect tree plantations from fire, as well as older timberlands, a fire control system was established. Before 1943 annual forest fires destroyed timber on from

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5,000 to 10,000 acres. This has been reduced to less than 500 acres yearly, because fires have been controlled while small. Fire-control costs have been about $20,000 for the past thirteen years, relieving federal and state forest fire organizations, and also taxpayers.

While 95 per cent of the company's lands will be permanently under forest, some of the best land will remain in agriculture. Permanent farms are being terraced by the company and rented to tenants who will cultivate them under soil conservation recommendations.

To completely stop erosion will require a great deal more work, but most of the active sheet erosion has been checked. As a result of this work, and that being done by other individuals and agencies, the company lakes are now clear most of the summer, and attractive to the public for recreation. Free access is given to these lakes, and the company leases cabin sites on their shores.

The results of scientific water and soil conservation have been almost magical, bringing about improvements that have attracted wide attention in the region. Having put its own house in order, it is logical for the company to point out the results attainable by private landowners adopting the same methods, using the company's own property for demonstration purposes. This is a feature of company advertising.

QUITE different are the public relations phases of Southern California Edison Company's hydroelectric properties up in the Big Creek country, in the Sierra Nevada mountains. The very idea of public relations was unknown in the utility industry forty years ago, when Edison acquired the first lands in what was to become one of the world's largest hydro enterprises, ranking at the time with the Panama Canal. Over the years, $158 million have been invested there, all private capital. Waters that once ran to waste are harnessed to yield power at different levels from 7,000 down to 1,000 feet, and are then stored for irrigating a vast area of agricultural land that was once desert.

Three years ago, the Big Creek project obtained certification as a tree farm, and people asked, "What is an electric company doing farming trees?" It was found helpful to compile some Big Creek facts, for general information.

Southern Californians are well-informed on community projects like the Owens river aqueduct, the Metropolitan aqueduct from the Colorado river, Hoover dam, the natural gas pipelines from Texas, and other great works made necessary by their population and industrial growth. Most of them if asked where their electricity comes from would probably say, "Why, from Hoover dam!" The fact is that Big Creek was supplying more power than Hoover dam today, years before the latter was built. One-quarter of all Edison power comes from the Big Creek region.

FORESTRY for the continuous production of lumber and wood products was practically unknown in this country when Edison first went up into the High Sierras, and so was the sense of responsibility toward future generations, to conserve the natural forests. As scientific forestry advanced, the company applied the knowledge gained, and in 1948 worked out a land management program in co-operation

The Tree Farm "Family"

"UTILITY management may find the tree farm 'family' movement useful in organizing a forestry project. Under this plan a sawmill, power company, or any other concern using forest products provides free management service to many owners, and receives first choice in buying timber when it is harvested. Some of the 'families' are held together by 'gentlemen's agreements,' but are mutually profitable, the owners having an assured market, and the organizing company being assured a steady supply of timber without buying forest lands."

with government agencies. The tree farm award came as recognition of good forest management.

SUCH management thins out defective and surplus trees, plants and reforests cut-over lands, controls grazing and pests, and protects against fire. Foresters designate trees for cutting by private operators, and supervise logging trails by which they are taken out, with covering and ditching to check erosion. An interesting feature is the quarter-acre "permanent plot" maintained in the center of each forty acres. Trees in these plots are counted and measured periodically to obtain growth rates, furnishing data for the whole forest.

Edison does not provide any recreational facilities in the Big Creek area, nor advertise to attract tourists. But there are many tourist camps and summer homes around the reservoirs, and roads have been built to them, and during the summer season thousands of visitors come in, to camp, fish, hike, and boat. It is believed that most of them live in California, and their interest in the forestry and irrigation aspects would naturally be greater than that of motorists from more distant places.

The word "big" is significant in Big Creek—it is so big that it has to be seen to realize what has been accomplished, and

how much has been done in the public interest.

UTILITY companies with watershed and forest lands will find experienced counsel, like these companies, in "tree farm" organization that centers in the American Forest Products Industries (1816 N street, N.W. 6), Washington, D. C. This organization is interested in tree farming for the lumber and woods products, and also in the markets for such products, now being grown by farmers and wood-lot owners.

In the United States today there are between four and five million wood-lot owners, who by scientific forestry management of their properties sell $700 million worth of lumber, pulpwood, and building materials, and turpentine, maple syrup, and other things—not forgetting Christmas trees. Increasing demands for forest products are being created by our thriving economy, and the wood-lot owner who has paid little attention to possibilities is usually surprised to learn about them. Which may be true of utility management.

For example, the southern sharecropper who quits raising cotton and goes to town to take a factory job leaves land that can today be profitably planted back to forest. Government figures report more than 55,000 such tenant farmers leaving the land in seven southern states since 1950. Under federal soil bank payments, up to 80 per cent of the cost of planting pine seedlings is paid the landowner over a ten-year period while the trees are growing to the pulpwood stage. In recent years pulp mills have been moving south, creating a ready market. Some paper companies have large forests, but these make up less than 10 per cent of the 178 million acres of commercial forests in eleven southern states. The industry is definitely one in which farmers and small landowners predominate.

They are, of course, utility customers, and any power company project looking toward good management of watersheds inevitably includes the benefits that can come to these customers.

TREE farming simply means growing trees as a crop, and is something for the farmer who knows how to make money. He may get technical advice from a professional forester, perhaps employed by government, but that is all he needs from government, and a forester employed by the power company that supplies his electricity may be the one to get him started.

There are some 17,000 trained foresters in the country, more than 7,000 of them employed by industry. The wood-lot owner can contact them through his state or local organizations, and if he has never sold timber before, can invite a forester to cruise his land and point out the steps needed for sound management.

Generally, the wood lot needs an immediate thinning first of all. It has grown like Topsy, visited only when firewood or fence posts were needed. Such cutting as it has undergone is in itself hazardous, leaving litter as a fire hazard. There are diseased and crooked trees and weed trees interfering with timber that will be of good quality if given a chance to grow unhampered.

There will probably be an immediate profit from thinning, because even some trash removed has some market value. Once "stock" trees have been established,

the tree farm will yield periodic harvests of timber, with selective cutting. The advice of a forester in designating trees ready for harvest is important in maintaining a healthy, productive lot. Fire protection by plowing firebreaks is also vitally important.

CERTIFICATION as a tree farm authorizes the wood-lot owner to display a "tree farm" sign, indicating that he is a conservationist, and inviting inspection of his management methods. To date, 44 states are participating in the tree farm movement, and several million acres are being added every year. This movement is stimulated by the growing demand for forest products. Americans use more than 5,000 articles made from wood, and the list is growing. There may be some localities in which markets have not yet developed, but the over-all national market is constantly growing, and the tree farm movement includes market development.

Utility management may find the tree farm "family" movement useful in organizing a forestry project. Under this plan a sawmill, power company, or any other concern using forest products provides free management service to many owners, and receives first choice in buying timber when it is harvested. Some of these "families" are held together by "gentlemen's agreements," but are mutually profitable, the owners having an assured market, and the organizing company being assured a steady supply of timber without buying forest lands. A power company fits in nicely as a "middleman" between tree farm owners with wood products to sell, and local industries using such products as raw materials. All power customers!

THE following stories from the files of the American Forest Products Industries show what kinds of landowners find tree farming profitable, and indicate opportunities in a company's territory.

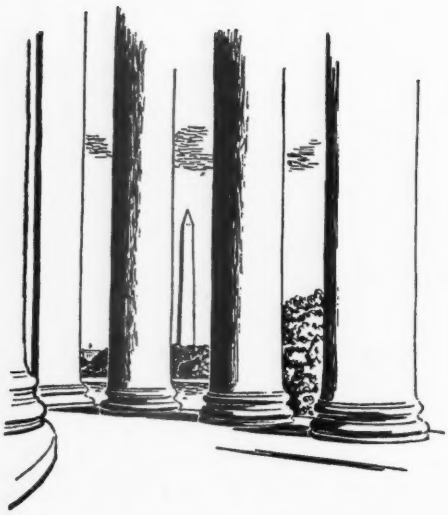
In 1947, a Georgia man bought 825 acres of badly run-down land. War savings and the first thinning helped finance the initial payment, and he planted 47,000 slash pine seedlings. Two years later he bought an adjacent 303 acres, planting 150,000 seedlings. In 1953 he marketed inferior trees and began harvesting naval stores, receiving $1,500 yearly. In eight more years he will be selling saw logs. The project was undertaken when his first daughter was born, and by then she will be ready to go to college.

Another southerner had to abandon a hillside cotton field, badly eroded. It grew up to wild seedling pines. He converted it into a tree farm, under forestry advice, and in a few years sold several hundred dollars worth of pulpwood thinnings, leaving a growing stand of saw logs that now run 10,000 board feet to the acre, and are still growing.

A western farmer thinning out a 20-acre wood lot under forestry advice, got lumber for a house, and in three years got another cash crop of thinnings.

A Great Lakes farmer with 80 acres of hardwood sold $4,800 worth of thinnings, and has a permanent stand that will yield prime timber every five years.

From coast to coast, farmers are waking up to the fact that money grows on trees, and wood products users are learning that tree farming insures an adequate supply of their raw materials. The place of the utility company with watershed lands in this picture is obvious.



Washington and the Utilities

Hell's Canyon Maneuvering

DEMOCRATS in the House of Representatives are using every trick in the book to get a Hell's Canyon bill authorizing construction of a federal high dam on the Snake river before the House at this session of Congress. None of them actually believe that such a bill will ever become law, notwithstanding the favorable vote in the Senate (45 to 38) in favor of authorizing the Bureau of Reclamation to build such a high dam. Even assuming that the House will pass the measure, a presidential veto is expected. As a matter of fact, if the presidential veto were not so certain, probably a good many Democrats would hesitate to vote for a measure which would, in effect, pull down dam construction by the Idaho Power Company already well under way, pay additional funds in damages, and then start all over again on a federal high dam.

But the real basis for all the maneuvering is politics as usual. The Democrats want to offset whatever political advantage the Republicans might seek to gain in the event a civil rights bill is passed. And they think they have a good issue in Hell's Canyon if it can be passed by a Democratic Congress and vetoed by a Republican President. But if it is defeated in a Democratic Congress, and that seemed to be the prospect in the House Interior Affairs Committee, the issue would lose much of its effectiveness because of the blurring of party lines and the responsibility for the fate of the bill.

ONLY a parliamentary maneuver in the House Interior Affairs Committee on July 10th saved the Hell's Canyon bill from final defeat. Knowing that the opposition had the votes to bury the bill to authorize construction of a federal dam at Hell's Canyon, Chairman Engle (Democrat, California) used the excuse of "no quorum" to postpone a final vote which would have killed not only the House bill but also the Senate-approved bill on this subject. A week later there was more parliamentary maneuvering to avoid a vote. Proponents of the federal dam, however, have not given up. Anticipating defeat in the House Interior Affairs Committee, two Pacific Northwest Representatives introduced a new bill last month which would allow the controversy to be considered by another committee.

THIS new Hell's Canyon bill, sponsored by Representatives Pfost (Democrat, Idaho) and Ullman (Democrat, Oregon), provides for construction of the federal dam by the Army Corps of Engineers, instead of the Bureau of Reclamation, as provided in pending bills, including the Senate-passed measure. For this reason, the new bill will be referred to the House Public Works Committee (not the Interior Affairs Committee) where its sponsors feel they have a better chance of success.

Ullman admitted that this maneuver was designed primarily to keep the issue alive, despite the adverse Interior Committee vote. So far as the present session of Congress is concerned, it appears that nothing but a united effort on the part of the Democrats will suffice to put the federal proposal across.

But the House Public Works Committee is more heavily loaded with Democrats (19 to 15) than the House Interior Affairs Committee (17 to 14) and they are believed to be more amenable to party discipline than the House Interior Affairs Committee. There two Democratic Representatives, Representative Haley Florida) and Representative Shuford (North Carolina), voted against the measure and Representative Powell (Democrat, New York) refused to vote. Over on the Public Works Committee, it is believed that one of the Republican Representatives, Mack of Washington, is favorable to the bill.

But the use of such obvious subterfuge to circumvent ordinary committee assignments of legislation is likely to bring on more difficulty for the party attempting it, because no committee wants its jurisdiction bypassed regardless of party affiliation. In addition, having the Engineers Corps build the dam instead of the Reclamation Bureau would mean junking of the irrigation feature because that is exclusively the responsibility of the U. S. Bureau of Reclamation.

What the Democrats hope to accomplish is to have the Public Works Committee pass a bill authorizing the Engineers Corps and then accede to the Senate bill in conference, switching back to the Reclamation Bureau. This would mean having the same number on the bill as that passed by the Senate and that would run into a question of dual jurisdiction because the Senate bill is already before the House Interior Affairs Committee.

Filibuster Blocking Bills

ALTHOUGH it is the first order of business for the Senate after the civil rights bill is disposed of, the long-awaited compromise bill to authorize the New York State Power Authority to construct power facilities on the Niagara river may have to wait until the filibuster ends before it is passed by the Senate. The chances are good for its passage.

The bill has the support of both the Senate Republican and Democratic leadership and is officially the Senate's unfinished business. Its sponsors, New York Senators Ives (Republican) and Javits (Republican) and Senator Kerr (Democrat, Oklahoma), have promised to make every effort to get final action by both houses of Congress before adjournment. There is a chance—via "unanimous consent"—for the Senate to pass this even during the filibuster. But the likelihood of "unanimous consent" is not promising for a number of reasons which have nothing to do with the merits of the bill.

A bipartisan move for early action by the House of Representatives raised new hope for congressional approval this session of a compromise bill for development of Niagara power. Arrangements to bring

the measure before the House within ten days or two weeks were under way in what appeared to be a major break in the six-year deadlock over the $600 million project.

The move grew out of conferences between Representative Charles A. Buckley, Democrat of the Bronx, and William E. Miller, Republican of upstate New York. The aim is to keep the bill from getting shunted aside in a session-end legislative jam. Such an eventuality was foreseen if original plans to wait for a Niagara bill to come over from the Senate were followed.

MEANWHILE, the New York State Power Authority has been prodding the Federal Power Commission to go ahead and act on the state's request for a license to develop Niagara power regardless of whether Congress acts or not. Thomas F. Moore, general counsel for the state authority, declared that "we're urging the FPC to get to work and resolve the issue." He said there was "no reason why the FPC can't go ahead" with the application and "save a lot of time" for the state in starting the project. So far, he said, the commission has done nothing since June 20th, when the federal court of appeals held that it had the authority to grant the license.

The State Power Authority applied for the license last August, and the commission denied it in November on the ground that it did not have the authority to issue such a license. This authority had been reserved by Congress, the commission held, when it approved the 1950 treaty between this country and Canada governing the use of Niagara water.

The court, however, held that the Senate's reservation attached to the treaty was not binding and did not deprive the FPC of authority to grant the license. If it wishes, the FPC can ask the Solicitor General of the United States to take an appeal to the United States Supreme Court, but no such action has been made known.

Although legislation dealing with the project is now pending in Congress, Mr. Moore said that its primary purpose was to authorize the state to market the power that would be produced.

Other Filibuster Casualties

LESS promising are the chances for a bill to permit TVA to finance future power expansion by issuing revenue bonds. Although a "compromise" bill has been reported in the Senate, the administration is apparently dissatisfied with it. As reported, the bill provides that TVA must repay to the Treasury annually an amount equal to the rate paid on the government's long-term obligations, a rate generally much higher than that on short-term obligations. Under the bill, TVA may build additional steam plants providing Congress does not disapprove in sixty days.

Three other temporary casualties of the filibuster are Eisenhower's appointees to the Federal Power Commission, Federal Communications Commission, and the Tennessee Valley Authority. In the case of FPC Chairman Kuykendall, who is now technically off the commission, the strategy of the opponents seems to be to stall because they do not have the votes to beat the confirmation. But the filibuster gives them an opportunity to delay Senate action indefinitely. Chairman Magnuson (Democrat, Washington) of the Senate Interstate Commerce Committee seems to be playing along with this partisan program for keeping Kuykendall off the commission all summer by agreeing to reopen hearings. He did this at the request of Senator Morse (Democrat, Oregon), who said he had some second

thoughts to give the committee with respect to Kuykendall's nomination. Morse had already testified at some length before the committee. A similar delay faces the President's choice of a new member of the TVA, Arnold R. Jones, and Frederick W. Ford, who has been named to the FCC.

AEC to Build Co-op Plants

LEWIS L. STRAUSS, chairman of the Atomic Energy Commission, has agreed to a Democratic proposal for the commission to construct small atomic power plants for rural co-operatives, it was announced recently. Mr. Strauss' concession to the Democratic program was hailed by Democrats on the congressional Joint Committee on Atomic Energy as the first big break in the three-year partisan fight over the atomic energy program. Democrats suggested that Mr. Strauss had opened the way for a compromise in the prolonged fight over whether the government or private industry should take the lead in development and construction of atomic power plants.

Mr. Strauss budged slightly from his previous "partnership" approach to development of atomic power plants at a secret and reportedly bitter meeting of a congressional joint subcommittee on atomic energy early last month. The meeting was called to discuss legislation authorizing the commission's future construction program.

One of the proposals advanced by Democrats at the meeting was that the commission finance construction of small atomic power plants being proposed by rural co-operatives. The plants would then be operated by the co-operatives, which would buy the heat produced from the atomic reactors. Mr. Strauss was reliably reported to have accepted this proposal as one means of getting construction under way on the rural co-operative projects. Mr. Strauss was said to have argued that the projects would be almost exclusively government-financed anyway with commission assistance and Rural Electrification Administration loans, and therefore there would be no objection to making them a commission-backed program.

Mr. Strauss denied reports that he had agreed to commission operation of the rural co-operative plants once constructed. He said in a statement that "my opposition to government construction and operation of large atomic reactors for the generation of electricity remains unchanged."

THE commission in September, 1955, issued an invitation for rural and municipal power groups to submit proposals to construct atomic power plants with capacities ranging from 5,000 to 40,000 kilowatts. The invitation was issued under the commission's "partnership" program of having private firms develop and construct atomic reactors.

The commission has been negotiating for more than a year with four rural cooperatives and municipal power groups. Thus far the groups have been unable to reach satisfactory terms with the REA and the commission. While agreeing to government construction of the rural cooperative projects, Mr. Strauss rejected once again Democratic proposals for government construction of other types of reactors.

Democrats, who have contended that the United States was falling behind in atomic development under the administration's program, are pressing for $150 million to be spent by the government on construction of reactors.

Telephone and Telegraph

Taxes Hit Bell Customers

THE impact of taxes on a business and the customers it serves is shown graphically in a recent Illinois Bell Telephone Company bulletin which disclosed that the company's average customer last year paid $60.34 in telephone taxes.

Illinois Bell itself paid federal, state, and local taxes totaling $128.5 million in 1956. The taxes, of course, were paid out of revenue derived from the rates charged the company's 2,130,000 customers, including residences and businesses, so the average contribution toward Illinois Bell's tax bill per customer was $60.34.

Actually, the company bulletin said, the residential telephone customer paid more than $60.34. "Business firms necessarily include the cost of their telephone service —including the tax portion—in the prices they charge their customers, who for the most part are the same people as those we serve. So eventually all telephone taxes are passed along to people in their homes. Thus the families in our territory really bear the total telephone tax burden."

Illinois Bell's taxes last year were equal to two and one-half times its net profits. They were 50 per cent larger than the company's expenditures for maintenance. "On the average, 28 cents of every dollar we collected from customers last year went for taxes," the company said. "That means, in effect, that every cent the customer paid us all through January, February, March, and the first thirteen days of April went for taxes."

Of Illinois Bell's tax dollar last year, 71 cents went to the federal government and 29 cents to state and local governments. Largest single item was a federal income tax bill of more than $51.5 million, 52 per cent of the company's gross earnings.

"No one questions the need for taxes," the bulletin said. "At the same time it's well for people to know how large a part of what they pay for goods and services goes to the government—and telephone service is just one example."

Air-to-ground Phoning

EXPERIMENTAL testing of air-to-ground telephone service will take place in September. The experiment is being conducted jointly by Michigan Bell Telephone Company and Illinois Bell Telephone Company between Detroit and Chicago. Facilities are now nearing completion.

When the experiment begins in September, the companies will use, on a temporary basis, radio frequencies on an unused common carrier channel previously assigned to land mobile telephone service. The same base stations and aircraft

mobile station frequencies will be shared by the two companies.

A typical call over the new system would be routed from the plane telephone by radio to the local base station antenna, then automatically by wire to the nearest switching terminal in a telephone building, where an operator would complete the call to a land telephone. The procedure would be reversed for ground-to-air service. The maximum range for air-to-ground calls during the developmental period will be about 100 miles, according to Michigan Bell engineers.

The experiments this fall are expected to lay the groundwork for a full-scale, commercial air-to-ground service. Michigan Bell officials have declined to speculate on how soon such service might be commercially available. If the experiments prove successful and the Federal Communications Commission grants enough frequencies, it was pointed out, the day may come when a businessman can call his wife from an airliner and tell her when to have dinner ready.

Pay Station Thefts

THE Illinois Bell Telephone Company is seeking authority to cut losses in thefts from coin-operated telephones. In a report submitted to the Illinois Commerce Commission, the company said thieves broke into 1,009 coin-box phones out of 52,500 in Chicago last year. All Bell companies in the nation reported only 2,596 thefts from a total of 847,810 phones.

The Illinois company wants authority to make semipublic phone subscribers financially responsible for thefts, chiefly through a provision permitting a $125 deposit on semipublic phones in locations likely to be burglarized. In addition, the company has asked that semipublic phone subscribers not making such a deposit be required to guarantee their bills in the event the phones were stolen. The company also seeks the right to designate where semipublic phones may be installed, or to refuse installation when a "bad risk" subscriber will not agree to a deposit.

Ohio Company Sues CWA

THE AFL-CIO Communications Workers of America faces a $3 million damage suit filed in Cincinnati recently as the aftermath of a seven-month strike against the Ohio Consolidated Telephone Company of Marion, Ohio. The company alleges it suffered $500,000 in damage to its cables and buildings during the strike and that the union entered into an "unlawful combination and conspiracy by and between its members to destroy" the company's property. The suit also charges that union acts forced the company to close exchanges in 12 communities.

France Takes over Cable Offices

CONCESSIONS to two cable companies to handle transatlantic cables in France will be terminated late next year, according to an announcement from the French government. Western Union Telegraph Company, and the American Cable & Radio Corporation have both been notified of the decision. American Cable is an affiliate of International Telephone & Telegraph Company.

The French action is aimed at closing up foreign cable offices in France and putting the routine of accepting and delivering overseas messages under the government's Ministry of Posts, Telegraphs, and Telephones. The cable companies would retain control of their underseas telegraph lines. A spokesman for Western Union said the French action will have only a

"minute impact" on the company's cable business, which totaled about $14 million last year.

The arrangement apparently contemplates nationalization of the American companies' facilities in France and end the present tough competition for cable business. It has been suggested that the French government may follow up its action by allocating all cable traffic, possibly by giving each company a share of the outgoing French cable business equal to the percentage of the total cable traffic it brings into the country.

Bell System Second Quarter

BELL system companies in the second quarter had an increase of close to 700,000 in the number of telephones they had in service. Also, the number of long-distance conversations handled was 7 per cent higher than year ago in the comparable period, Frederick R. Kappel, president of AT&T, reported.

A further plea for higher rates for Bell companies was made in the company's quarterly communication. Kappel stated that at present the rate of earnings on total capital invested in the Bell system is 6.8 per cent. "We are convinced the rate should be higher and we are working to that end," he said. The high cost of money and the continuing increase in other costs were cited as underlying the need for rates that produce good earnings.

Consolidated net income for the three months ended May 31st was $214,266,059, equivalent to $3.31 a share on 63,058,057 average shares outstanding.

Doerfer Interview

JOHN C. DOERFER, new chairman of the Federal Communications Commission, recently indicated in an interview some of his own views with respect to current problems facing the FCC. The new chairman says he will work to abolish the so-called "protest" amendment to the Federal Communications Act, adopted by Congress in 1952. The amendment permits anyone to challenge a commission action. Doerfer complained that the amendment is responsible for long delays in making commission rulings final.

On most of the radio-TV issues of the day, Doerfer is apparently at odds with Congress, particularly with respect to pay-as-you-see TV and network practices. The chairman said he favors a "fair trial to determine whether the people want" subscription television, but stressed that any demonstration of the controversial proposal should be under "strict control." He said he would not permit it in places of less than four TV outlets. "I'm in favor of a trial run, with complete protection," he said, "so that free TV won't be blasted out of the country."

July 15th was the deadline for comments by advocates and opponents of subscription television and a commission decision on whether to permit a trial run is expected shortly.

Doerfer said he is a strong defender of "free competition" in broadcasting and is still not convinced that the "option time" and "must buy" policies of the networks are "predatory," despite congressional feelings to the contrary. The "must buy" policy requires advertisers to buy time on a minimum number of the network's affiliates. "Option time" gives the networks the best evening viewing hours. Two congressional staff reports have criticized the practices and called for more FCC regulation. Doerfer said there may be some "need for correction," but this will have to await a commission study, due at the end of September.

Financial News and Comment

By OWEN ELY

Quinton Suggests Greater Use of Debentures

HAROLD QUINTON, president of Southern California Edison Company, discussed the future financing of electric utilities in a recent talk before the Pacific Coast Electrical Association. In the past decade, he pointed out, the principal concern of the industry was to meet the unparalleled increase in demand for electricity and to build up satisfactory reserve capacity. With this accomplished, the industry may now be able to turn to more orderly planning for future expansion, particularly with reference to financing.

It has been estimated that electric utility plant expenditures will increase to an average of $4 billion a year, and that in future $2.5 billion will have to be raised annually by security sales compared with an average of $2.3 billion in the past decade. This program becomes more difficult due to the following considerations: (a) Over the next decade the utilities will have to pay off or refund some $2.3 billion bonds issued in the late 1930's in refunding operations. (b) The situation of the U. S. Treasury remains difficult, with some 54 per cent of the national debt maturing in less than a year and 77 per cent within five years. (c) Money rates have been increasing and the Treasury now has to pay the highest rates since the bank holiday of 1933.

MR. QUINTON points out that we are now in our fourth higher level or plateau of money costs starting with World War II. If inflation continues, those who save will increasingly demand a higher rate (in dollars of declining purchasing power) for the use of their savings. However, this condition is not abnormal from a long-term viewpoint—we are operating in more nearly a supply-and-demand market for money now than at any time since 1933. "Actually," he stated, "the discount rate was not less than 3 per cent from the inception of the Federal Reserve Act in 1913 to 1930, and the

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present figure of 4 per cent as a prime commercial bank rate is less than the historical average prior to 1930. If money rates do not hold at approximately the present or even higher levels and expansion of the economy continues, it will be the result of more Treasury and central bank credit management, with further stimulated inflation as an inevitable consequence."

The utility industry should have the experience and ingenuity to meet this challenge, since in the past utilities have developed (as a matter of necessity) more new ideas about financial policy than most other industries. But forward planning for at least two to five years ahead seems essential in order to maintain some flexibility of choice as to methods of financing, without serious disturbance to the capital structure which the company may wish to maintain.

Mr. Quinton feels that present high tax rates will increasingly influence utility policy and that it may prove necessary to lower the dividend pay-out rate somewhat —although, in general, dividend rates will continue to increase. If more earnings can be retained in the business, fewer new equity offerings will be needed. High pay-outs mean that "tax-paying stockholders share their proceeds with the government and the utility must then issue more shares. . . . the government becomes the beneficiary in the resultant process of double taxation." In this connection he thinks that stock dividends may come into greater usage as a means of retaining cash, while giving stockholders the benefit of a capital gains tax rate.

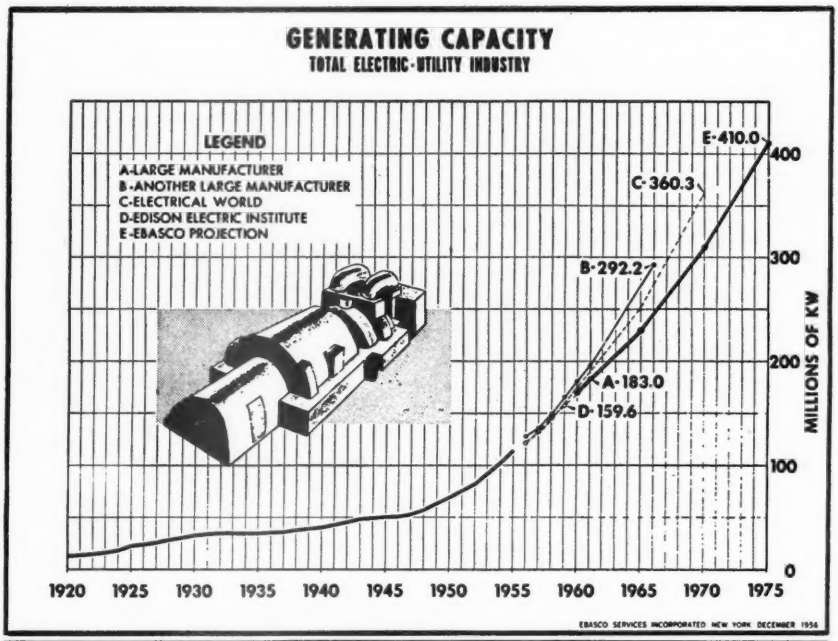
WHAT influence will continued high taxes and increasing money rates have on the character of senior financing? The importance of the tax saving in the case of bond interest has become increasingly important—in California about 54 per cent can be deducted for federal and state taxes. On the other hand, if the debt ratio becomes too high the company's financial position is weakened and in the long run there might be an over-all higher money cost. However, there may be an intermediate policy with respect to the choice between issuance of debentures instead of mortgage bonds.

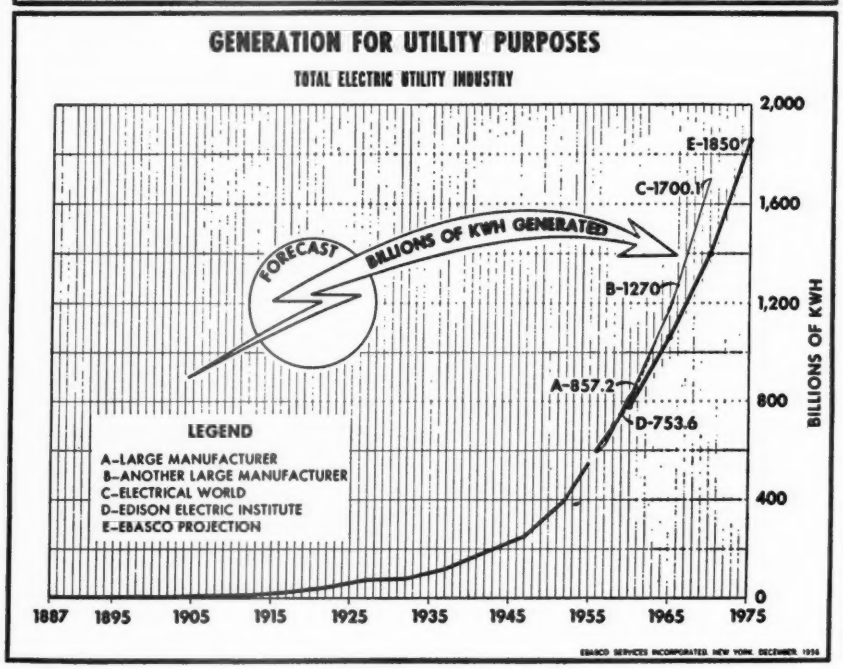
The spread between the cost of debenture and preferred stock financing has increased, compared with several years ago when money rates were lower. As money costs mount we may see more sales of debentures in lieu of preferred stock offerings. The tax saving could, in effect, be used to retire the debentures although this would perhaps require the use of serial debentures and the latter might be somewhat difficult to handle during a period of continued heavy demand for new funds.

More Trouble over "KW Capacity" Statistics

IN past years this department has called attention to the conflict between statistics for "capacity" and "capability" of modern steam-electric generating units, and a special article by Hendrik Diamant appeared in the FORTNIGHTLY.[1] While the subject is highly technical, in a broad way the differences arise from using conservative manufacturer's "name-plate capacity" in some cases, while in other cases more optimistic "capability" figures are used by the utility company. With the use of hydrogen cooling and other modern practices, the capability figure might be 10-15 per cent more than the "name-plate" figures. However, this excess might be re-

[1] "Rated *versus* Actual Capacity for Power Production," by Hendrik A. Diamant, PUBLIC UTILITIES FORTNIGHTLY, January 17, 1952, Volume XLIX, No. 2, p. 79.


GENERATING CAPACITY
TOTAL ELECTRIC-UTILITY INDUSTRY
LEGEND
A-LARGE MANUFACTURER
B-ANOTHER LARGE MANUFACTURER
C-ELECTRICAL WORLD
D-EDISON ELECTRIC INSTITUTE
E-EBASCO PROJECTION
E-410.0
C-360.3
B-292.2
A-183.0
D-159.6
400
300
200
100
0
MILLIONS OF KW
1920 1925 1930 1935 1940 1945 1950 1955 1960 1965 1970 1975
EBASCO SERVICES INCORPORATED NEW YORK DECEMBER 1956


GENERATION FOR UTILITY PURPOSES
TOTAL ELECTRIC UTILITY INDUSTRY
2,000
1,600
1,200
800
400
0
BILLIONS OF KWH
E-1850
C-1700.1
B-1270
A-857.2
D-753.6
FORECAST
BILLIONS OF KWH GENERATED
LEGEND
A-LARGE MANUFACTURER
B-ANOTHER LARGE MANUFACTURER
C-ELECTRICAL WORLD
D-EDISON ELECTRIC INSTITUTE
E-EBASCO PROJECTION
1887 1895 1905 1915 1925 1935 1945 1955 1965 1975
EBASCO SERVICES INCORPORATED NEW YORK DECEMBER 1956

duced in the over-all picture because capability of very old units might be even less than name plate, while hydro plants' capacity would vary with stream flow, etc.

The Edison Electric Institute in its annual statistical bulletins has consistently used name-plate ratings as reported to the FPC. In pages 6, 7 of the 1956 bulletin the following statement appears as a footnote:

> The name-plate rating is the basis of guaranty from the manufacturer to the purchaser covering efficiency, temperature rises, etc., under certain specified conditions. In practice, due to differences in operating conditions, to modifications since installation, or to incorrect name-plate rating, the actual capacity of generating units might be quite different, usually higher though sometimes lower than the name-plate rating. In their own reports most companies carry this "capability rating" instead of name-plate rating because it more nearly sets forth capacity available under actual operating conditions. Neither the "name plate" nor the "capability rating," however, gives the full measure of the capacity resources of generating facilities. Most generating equipment driven by steam turbines or by steam engines is capable of considerable overload, often for quite an extended period. With generators driven by water wheels or water turbines, stream flow or water conditions govern the possible output, but even under adverse conditions in a balanced and co-ordinated system (as between steam and hydro) such generators are capable of carrying considerable overload for a period of time.

STATISTICS on generating capacity are also prepared by the *Electrical World* and the Federal Power Commission. The earliest figures to appear for a given year are those in the *Electrical World's* annual statistical number, usually out in the following January, while EEI figures in preliminary form are usually available in April.

Several months ago a 12-page report was issued by Carl J. Mueller and F. Douglas Campbell, members of a subcommittee of the electric power survey committee, entitled "Disagreement between Reports Concerning the Electric Industry," calling attention to substantial differences in the *EW* and EEI capacity figures. Both men are connected with Detroit Edison, and President Walker L. Cisler of that company heads the EEI Electric Power Survey Committee. The *EW* figures and projections for new additions to generating capacity exceeded the EEI statistics by the following net amounts:

1956	647,208 kw
1957	240,125
1958	169,375
1959	2,101,800
Total after 1959	10,806,260

The *Electrical World* questionnaire sent to the utility companies (the replies to which were used in its compilation) used the expression "maximum rated capability" and it may be surmised that omission of the word "manufacturer's" meant that many utilities used their own capability figures for modern steam units which were materially higher than name plate. This seems borne out by the fact that the *EW* figures for hydro capacity for 1956-57 were slightly lower than EEI figures, while those for steam were larger.

THERE are of course many other discrepancies between the two sets of figures, which are carefully tabulated in the report. The major difference is in the aggregate anticipated addition to capacity for the indefinite period "after 1959."

PUBLIC UTILITIES SECURITIES
OFFERED FOR SUBSCRIPTION AND/OR SALE
(000 omitted)

	January 1 to June 30, 1957					January 1 to June 30, 1956				
	Total	Electric Companies	Gas Companies	Telephone Companies	Other Companies	Total	Electric Companies	Gas Companies	Telephone Companies	Other Companies
Long-Term Debt										
Offered Publicly	$1,711,843	$ 691,000	$464,798	$552,045	$ 4,000	$ 744,085	$467,500	$126,085	$140,000	$10,500
Offered through Subscription	145,573	101,052	-	44,521	-	52,027	-	1,173	50,854	-
Offered Privately	139,860	30,950	112,900	33,960	12,050	210,582	24,000	129,715	35,000	21,867
Total	$2,047,275	$ 823,002	$577,698	$630,526	$16,050	$1,006,694	$491,500	$256,973	$225,854	$32,367
Preferred Stock										
Offered Publicly	$ 104,057	$ 46,057	$ 45,000	$ 10,750	$ 2,250	$ 176,242	$117,265	$ 44,000	$ 14,977	-
Offered through Subscription	47,522	1,639	45,483	400	-	5,066	-	5,066	-	-
Offered Privately	4,250	-	-	750	3,500	12,900	5,600	2,500	3,500	1,300
Total	$ 155,829	$ 47,696	$ 90,483	$ 11,900	$ 5,750	$ 194,208	$122,865	$ 51,566	$ 18,477	$ 1,300
Common Stock										
Offered Publicly	$ 139,165	$ 111,656	$ 21,718	$ 1,103	$ 4,688	$ 40,505	$ 29,134	$ 1,851	$ 8,479	$ 1,041
Offered through Subscription	341,383	270,314	58,599	12,470	-	168,743	130,088	13,979	24,676	-
Total	$ 480,548	$ 381,970	$ 80,317	$ 13,573	$ 4,688	$ 209,248	$159,222	$ 15,830	$ 33,155	$ 1,041
Total Financing	$2,683,653	$1,252,668	$748,498	$655,999	$26,488	$1,410,150	$773,587	$324,369	$277,486	$34,708
SEGREGATION OF FINANCING - BY PURPOSE										
Total Refundings	$ 67,160	$ 12,835	$ 53,500	-	$ 825	$ 57,377	$ 4,026	$ 18,869	$ 34,482	-
Total Divestments	$ 36,381	$ 9,975	$ 21,718	-	$ 4,688	-	-	-	-	-
New Money										
Long-Term Debt	$1,980,941	$ 810,167	$524,198	$630,526	$16,050	$ 967,825	$491,500	$238,104	$205,854	$32,367
Preferred Stock	155,004	47,696	90,483	11,900	4,925	175,700	118,840	51,566	3,994	1,300
Common Stock	444,167	371,995	58,599	13,573	-	209,248	159,221	15,830	33,156	1,041
Total New Money	$2,580,112	$1,229,858	$673,280	$655,999	$20,975	$1,352,773	$769,561	$305,500	$243,004	$34,708
Total Financing	$2,683,653	$1,252,668	$748,498	$655,999	$26,488	$1,410,150	$773,587	$324,369	$277,486	$34,708
SEGREGATION OF FINANCING - BY TYPE										
Competitive Bidding	$1,546,130	$ 763,130	$233,000	$550,000	-	$ 781,090	$519,240	$111,350	$140,000	$10,500
Negotiated Sales	$ 408,935	$ 85,583	$298,516	$ 13,898	$10,938	$ 179,742*	$ 94,659	$ 60,586	$ 23,456*	$ 1,041
Subscription										
Competitive Bidding	$ 146,772	$ 96,289	$ 50,483	-	-	$ 44,499	$ 39,433	$ 5,066	-	-
Negotiated Sales	295,596	189,389	53,328	$ 52,879	-	137,057	63,399	7,204	$ 66,454	-
No Underwriting	92,110	87,327	271	4,512	-	44,280	27,256	7,948	9,076	-
Total Subscription	$ 534,478	$ 373,005	$104,082	$ 57,391	-	$ 225,836	$130,088	$ 20,218	$ 75,530	-
Private Sales	$ 194,110	$ 30,950	$112,000	$ 34,710	$15,550	$ 223,482	$ 29,600	$132,215	$ 38,500	$23,167
Total Financing	$2,683,653	$1,252,668	$748,498	$655,999	$26,488	$1,410,150	$773,587	$324,369	$277,486	$34,708

* Includes $14,377,000 preferred stock not underwritten.

Ebasco Services Incorporated, Corporate Finance Department, July 8, 1957 - AVR

Much of this discrepancy seemed due to differing use made of data obtained from the Army Engineers and the Bureau of Reclamation as sponsors of future hydro projects—the *EW* data exceeded the EEI in this category by 6,139,500 kilowatts.

The bulletin concludes:

> Although the *EW* questionnaire may not have been entirely specific as to exactly what was wanted, much of the fault is still believed to rest with the industry. Experience in EEI work indicates great difficulty in getting precise, accurate, and uniform data from the operating companies. There is room for considerable improvement along these lines and it would be well for the industry to give serious attention to this matter.

From the financial angle, it is obvious that differences in kilowatt capacity figures raise questions regarding the accuracy of (a) construction costs per kilowatt, (b) reserve capacity in relation to peak load, (c) future construction needs for new generating units, etc.

Residential Rates—Municipalities versus Investor-owned Utilities

DIFFICULTIES in comparing the financial results for investor-owned and publicly owned electric utilities are the lack of up-to-date statistical data, the much larger proportion of hydro output in the public power setup, and the differences in the tax burden. The Federal Power Commission about two months ago published its annual "Statistics of Electric Utilities in the U. S., Publicly Owned" covering the 1955 calendar year. This excludes federal projects (which are largely wholesale rather than retail distributors of electricity) and covers 261 publicly owned class A and B electric utilities, with net electric utility plant investment of about $2.2 billion. These companies served about 4.1 million ultimate consumers and had 1955 revenues of $525 million. The report covers about 60 per cent of the non-federal publicly owned utilities, excluding small units which would not come under the A and B classification and possibly others which do not report to the FPC.

Capitalization of these municipally owned utilities, public utility districts, etc., was about 46 per cent long-term debt and 54 per cent "investment of municipality and surplus." The return on the investment in 1955 was about 7.3 per cent. Rate of return has been steadily declining from the 8.9 per cent earned in 1947-48.

A TABLE on page XII gives a separation of some of the data as between the Tennessee valley area, the Pacific Northwest area, and "other areas." The latter classification would eliminate much of the effect of hydro operations which are an important factor in the Tennessee valley and Pacific Northwest areas. It is interesting to note that average annual residential sales in "other areas" were 2,483 kilowatt-hours, which compares with 2,562 kilowatt-hours for all class A and B investor-owned electric utilities. This would seem to indicate that municipalities are less active in promoting new uses of electricity.

The average revenue per kilowatt-hour was 2.41 cents for municipalities compared with 2.77 cents for private plants, the lower rate being accounted for by the difference in the tax load. While tax figures for "other areas" are not shown, all of the publicly owned utilities included in the report paid 2.9 per cent of revenues in taxes, while investor-owned electric utilities (as reported by the EEI) paid 23.7 per cent. Adjustment for the higher tax

load would raise the municipal rate to around 2.91 cents or about 5 per cent more than the average rate for investor-owned utilities—despite much higher capital costs.

The Preliminary Summary Prospectus

THE "Preliminary Summary Prospectus" has now become established as one of the numerous documents issued in connection with the public offering of a utility security. This new four-page leaflet may be distributed to any potential purchaser, under Rule 434A adopted by the SEC early this year. (See Release No. 3722 for method of use.) A supply of the summary prospectus is furnished to the banking group which wins the competitive bid, for convenient use as a sales medium.

The first page of the summary retains some of the technical format of the regular prospectus, but adds other information. Thus in the case of the offering of an unlisted stock, it may point out that the issue is traded in the over-counter market, and give a recent quotation and the range of the bids for the year to date. It also describes the subscription rights, if these are issued, and mentions the functions of the underwriters in handling the issue. While there is no stereotyped setup for the other three pages, they may describe the company's business, the construction program, and application of proceeds of the offering, and the rights of the issue being sold in relation to other securities.

RECENT FINANCIAL DATA ON GAS UTILITY STOCKS

Annual Rev. (Mill.)			*7/12/57 Price About*	*Dividend Rate*	*Approx. Yield*	*Recent Share Earnings*	*% Increase*	*Aver. Incr. In Sh. Earns. 1951-56*	*Price-Earns. Ratio*	*Div. Payout*	*Approx. Common Stock Equity*
		Pipelines									
$ 4	O	Ala.-Tenn. Nat. Gas	19	$1.20	6.3%	$1.36Ma	D4%	14%	14.0	89%	40%
16	O	Commonwealth N. G. ...	34	1.60	4.7	2.77De	6	X	12.3	58	39
17	O	E. Tenn. Nat. Gas	9	.60	6.7	.83De	30	X	10.8	72	19
19	O	Gulf Interstate Gas	10	.50	5.0	.77De	—	—	13.0	65	18
71	S	Miss. River Fuel	36	1.60	4.4	2.33De	16	8	15.5	69	50
80	S	Southern Nat. Gas	46	2.00	4.3	2.32Ma	NC	4	19.8	86	46
268	O	Tenn. Gas Trans.	33	1.40	4.2	1.85Ma	1	18	17.8	76	20
175	O	Texas East. Trans.	27	1.40	5.2	1.88Ma	D20	3	14.4	74	24
71	O	Texas Gas Trans.	22	1.00	4.5	2.10Ma	9	4	10.5	48	27
88	O	Transcont. Gas P. L.	19	1.00	5.3	1.43Ma	18	19	13.2	70	19
		Averages			5.1%				14.1	71%	
		Integrated Companies									
158	S	American Nat. Gas	56	$2.60	4.6%	$3.90Ma	D3%	13%	14.4	67%	35%
50	A	Arkansas-Louis. Gas	27	1.20(j)	4.4	1.56Ma	14	23	18.0	80	53
47	O	Colo. Interstate Gas	65	1.25	1.9	4.92Ma	D11	36	13.2	25	35
343	S	Columbia Gas System ...	17½	1.00	5.7	1.41Ma	D2	7	12.4	71	43
7	O	Commonwealth Gas	7	.10	1.4	.54De	107	D	13.0	19	76
12	S	Consol. Gas Util.	15½	.90	5.8	1.35Ap	41	—	11.5	67	61
266	S	Consol. Nat. Gas	45	1.90	4.2	3.58Ma	—	4	12.6	53	67
186	S	El Paso Nat. Gas	44	1.30	2.9	2.02Ma	10	7	21.8	64	24
44	S	Equitable Gas	30	1.60	5.3	2.28Ma	10	4	13.2	70	36
17	O	Kansas-Nebr. Nat. Gas ..	36	1.65	4.6	2.44De	2	3	14.8	68	30
95	S	Lone Star Gas	36	1.80	5.0	2.22Ma	D9	5	16.2	81	48
25	S	Montana-Dakota Util. ..	26	1.00	3.8	1.42Ma	D4	19	18.3	70	32
23	O	Mountain Fuel Supply ..	25	1.20	4.8	1.66De	10	9	15.1	72	57
81	S	National Fuel Gas	19	1.10	5.8	1.68Ma	—	8	11.3	65	62
113	S	Northern Nat. Gas	56	2.60	4.6	3.67Ma	11	7	15.3	71	37
43	S	Oklahoma Nat. Gas	27	1.50	5.6	2.08My	D12	6	13.0	72	29
113	S	Panhandle East. P. L. ...	53	1.80	3.4	2.75De	10	16	19.3	65	35

13	O	Pennsylvania Gas	24	1.20	5.0	2.26De	40	D	10.6	53	64
166	S	Peoples G. L. & Coke ...	43	2.00	4.7	2.93Ma	D9	7	14.7	68	42
34	O	Southern Union Gas	29	1.12	3.8	1.52De	D10	9	19.1	74	35
273	S	United Gas Corp.	35	1.50	4.3	2.43Ma	17	7	14.4	62	43
		Averages			4.4%				14.9	67%	
		Retail Distributors									
28	A	Alabama Gas	29	$1.60	5.5%	$2.11Ma	D10%	31%	13.7	76%	42%
44	O	Atlanta Gas Light	29	1.60	5.5	1.99Ma	D28	11	14.6	80	36
5	O	Berkshire Gas	16	.90	5.6	1.52F	22	46	10.5	59	35
6	O	Bridgeport Gas	28	1.60	5.7	2.62Ma	11	48**	10.7	61	43
4	O	Brockton-Taunton Gas ..	14	.90	6.4	1.29De	32	60	10.8	70	40
59	S	Brooklyn Union Gas	34	2.00	5.9	2.79Ma	D3	6	12.2	72	49
1	O	Cascade Nat. Gas	9	—	—	Def.De	—	—	—	—	13
36	O	Central El. & Gas	16	.90	5.6	1.45Ma	D10	9	11.0	62	17
12	O	Central Indiana Gas	13	.80	6.2	1.06Ma	10	4	12.3	75	65
5	O	Chattanooga Gas	5	.30	6.0	.38F	D11	14	13.2	80	45
64	O	Gas Service	23	1.36	5.9	1.67Ma	D25	0	13.8	81	40
7	O	Hartford Gas	38	2.00	5.3	3.01De	39	5	12.6	66	48
2	O	Haverhill Gas	21	1.32	6.3	2.05My	22	2	10.2	64	58
31	O	Houston Nat. Gas	37	1.50	4.1	2.26Jy	24	6	16.4	66	22
17	O	Indiana Gas & Water ...	19	1.00(k)	5.3	1.51Ap	D5	9	12.7	66	45
45	S	Laclede Gas	14	.80	5.7	1.12Ma	D7	7	12.5	71	35
4	O	Michigan Gas Utils.	22	1.05	4.8	1.36Ma	D8	14	16.2	77	38
5	O	Midsouth Gas	11	Stk.(o)	—	.65Ap	4	D	16.9	—	39
42	O	Minneapolis Gas	25	1.40	5.6	2.06Ma	—	14	12.1	68	38
15	O	Miss. Valley Gas	17	1.12	6.6	1.31Ma	D30	5	13.0	85	30
4	O	Mobile Gas Service	22	1.00	4.5	1.17De	D13	D	18.8	85	33
7	O	New Haven Gas	28	1.70	6.1	2.26De	D6	10	12.4	75	66
12	O	New Jersey Nat. Gas ...	27	1.40(i)	5.2	2.36Ma	12	—	11.4	59	32
80	O	No. Illinois Gas	19	.88	4.6	1.34Ma	D2	—	14.2	66	54
8	O	North Penn Gas	12¼	1.00	8.0	1.02De	23	7	12.3	98	56
6	O	North Shore Gas	15	.80	5.3	1.16De	23	6	12.9	69	54
224	S	Pacific Lighting	36	2.00	5.6	2.54Ma	D11	14	14.2	78	39
19	O	Pioneer Nat. Gas	27	1.32	4.9	2.02De	15	17	13.4	65	39
13	O	Portland Gas & Coke ...	17	.60	3.5	1.28Ma	16	8	13.3	39	36
2	O	Portland Gas Lt.	9	.75	8.3	.73De	D40	—	12.3	103	25
8	A	Providence Gas	9	.56	6.2	.63De	6	15	14.3	89	60
3	A	Rio Grande Valley Gas ..	3	.15	5.0	.28De	7	9	10.7	54	58
5	O	So. Atlantic Gas	12	.80	6.7	1.05De	17	2	11.4	76	36
11	O	South Jersey Gas	27	1.40	5.2	2.03My	D4	28	13.3	69	55
26	S	United Gas Impr.	36	2.00	5.6	2.45Ma	5	1	14.7	82	64
48	S	Wash. Gas Light	36	2.00	5.6	3.13Ma	D3	4	11.5	64	43
8	O	Wash. Nat. Gas	14	.10(l)	0.7	.35Ma	D20	X	—	28	41
7	O	Western Ky. Gas	12	.60	5.0	.87Ma	D31	20	13.8	69	38
		Averages			5.5%				13.1	71%	

RECENT FINANCIAL DATA ON TELEPHONE, TRANSIT, AND WATER STOCKS

Annual Rev. (Mill.)			*7/12/57 Price About*	*Divi. dend Rate*	*Approx. Yield*	*Recent Share Earnings*	*% Increase*	*Aver. Incr. In Sh. Earns. 1951-56*	*Price-Earns. Ratio*	*Div. Pay-out*	*Approx. Common Stock Equity*
		Communications Companies									
		Bell System									
$5,825	S	Amer. T. & T. (Cons.) ..	176	$9.00	5.1%	$13.13*My	—	2%	13.4	68%	67%
274	A	Bell Tel. of Canada	43	2.00	4.7	2.25De	D3%	2	19.1	89	64
43	O	Cin. & Sub. Bell Tel.	83	4.50	5.4	5.58De	2	4	14.9	81	100
209	A	Mountain Sts. T. & T. ...	118	6.60	5.6	9.17F	15	13	12.9	72	68
308	A	New England T. & T. ...	135	8.00	5.9	8.31Ma	D6	4	16.2	96	60
792	S	Pacific T. & T.	130	7.00	5.4	9.08My	2	4	14.3	77	58
98	O	So. New Eng. Tel.	38	2.00	5.3	2.19De	13	3	17.4	91	59
		Averages			5.3%				15.5	82%	

		Independents									
5	O	Anglo-Canadian Tel.	35	$ .60	1.7%	$3.19Ma	11%	54%	11.0	19%	44%
37	O	British Col. Tel.	42	2.00	4.8	2.86Ma	D2	12	14.7	70	38
3	O	Calif. Inter. Tel.	11	.70	6.4	.86De	D13	—	12.8	81	24
15	O	Calif. Water & Tel.	20	1.20	6.0	1.52De	4	10	13.2	79	42
16	O	Central Telephone	21	1.00(m)	4.8	2.00De	16	16	10.5	50	29
4	O	Commonwealth Tel.	14	.80	5.7	1.17De	D10	—	12.0	68	38
4	O	Florida Telephone	24	.90	3.8	1.11My	NC	D	21.6	81	42
237	S	General Telephone	42	1.80	4.3	3.14Ma	NC	32	13.4	57	37
15	O	Hawaiian Telephone	18	1.00	5.6	1.29Ap*	D11	19	13.9	78	42
6	O	Inter-Mountain Tel.	14	.80	5.7	.80De	D16	2	17.5	100	62
22	S	Peninsular Tel.	54	2.00	3.7	2.41Ap	NC	2	22.4	83	46
21	O	Rochester Tel.	21	1.00	4.8	1.62Ma	NC	6	13.0	62	39
3	O	Southeastern Tel.	18	.90	5.0	1.44Ma	4	13	12.5	63	42
9	O	Southwestern St. Tel.	20	1.12	5.6	1.58De	16	4	12.7	71	40
31	O	United Utilities	21	1.20	5.7	1.63De	D5	5	12.9	74	36
13	O	West Coast Tel.	18	1.00	5.6	1.38Ma	D11	18	13.0	72	41
252	S	Western Union Tel.	18	1.00	5.6	2.21De	5	15	8.1	45	86
		Averages			5.0%				13.8	68%	
		Transit Companies									
19	O	Baltimore Transit	10	$ .50	5.0%	$ .18De	D86%	X	—	278%	28%
13	O	Cincinnati Transit	4	.30	7.5	.48De	41	10%	8.3	63	46
8	O	Dallas Transit	5	.35	7.0	.90De	58	0	5.6	39	54
33	S	Fifth Ave. Coach Lines ..	24	2.50	10.4	3.47De	21	4	6.9	73	63
244	S	Greyhound Corp.	16	1.00	6.3	1.27De	8	—	12.6	79	52
23	O	Los Angeles Transit	18	1.40	7.8	1.23De	30	11	14.6	114	92
26	S	Nat. City Lines	23	2.00	8.7	2.45De	D10	11	9.4	82	94
13	O	Niagara Frontier Trans. .	8	.60	7.5	.28De	D81	—	—	214	82
69	O	Phila. Transit	7	.60	8.6	1.67De	31	8	4.7	36	38
6	O	Rochester Transit	5½	.40	7.3	.68De	58	18	8.1	59	41
23	O	St. Louis P. S.	11	1.40	12.7	.69De	1	19	15.9	203	97
15	S	Twin City R. T.	16	1.80	11.3	1.21De	1	D	13.2	149	48
22	O	United Transit	5	.60	12.0	.88De	D15	21	5.7	68	48
		Averages			8.6%				9.5	98%	
		Water Companies									
		Holding Companies									
40	S	American Water Works .	10½	$ .60	5.7%	$1.00Ja	2%	6%	10.5	60%	16%
		Operating Companies									
5	O	Bridgeport Hydraulic ...	29	$1.60	5.5%	$2.10De	2%	4%	13.8	76%	58%
13	O	Calif. Water Service	39	2.20	5.6	3.17Ap	14	3	12.3	69	32
4	O	Elizabethtown Water ...	37	1.60	4.3	3.28De	16	31	11.3	49	56
9	S	Hackensack Water	39	2.00	5.1	2.87De	D20	2	13.6	70	37
8	O	Indianapolis Water	18	1.00	5.6	1.42De	D12	17	12.7	70	34
5	O	Jamaica Water	33	2.00	6.1	2.88Ma†	2	8	11.5	69	25
4	O	New Haven Water	56	3.00	5.4	2.88De	D13	—	19.4	104	58
2	O	Ohio Water Service	27	1.50	5.6	2.35Ma	D5	7	11.5	64	36
8	O	Phila. & Sub. Water	33	.50(e)	1.5	3.08Ma	36	3	10.7	16	28
2	O	Plainfield Un. Water ...	59	3.00	5.1	5.04De	D6	5	11.7	60	39
4	O	San Jose Water	43	2.80	6.5	3.59My	5	9	12.0	78	45
10	O	Scranton-Springbrook ..	16	.90	5.6	1.38Ma	—	8	11.6	65	29
5	O	Southern Calif. Water ..	14	.80	5.7	1.19Ma	13	8	11.8	67	34
4	O	W. Va. Water Service ..	19	1.40	7.4	1.67Ma	7	—	11.4	84	17
		Averages			5.4%				12.5	67%	

A—American Stock Exchange. O—Over-counter or out-of-town exchange. S—New York Stock Exchange. Ja—January; F—February; Ma—March; Ap—April; My—May; Je—June; Ju—July; Au—August; Se—September; Oc—October; N—November; De—December. (e)—Also paid 5 per cent stock dividend December 1, 1956. (i)—Paid 2 per cent stock dividend December 10, 1956. (j)—Paid 10 per cent stock dividend November 21, 1956. (k)—Paid 3 per cent stock dividend December 19, 1956. (l)—One share of Pacific Northwest Pipeline for 70 shares held. (m)—Paid 10 per cent stock dividend January 2, 1957. (o)—Forty per cent stock dividend paid June 14, 1957. NC—Not comparable. NA—Not available. X—Deficit 1951. *On average shares. **1951 was an abnormally bad year. †Adjusted to eliminate 66 cents per share of nonrecurring tax savings.

What Others Think

Utility Head Opposes Two-part Gas Rate

DOMESTIC consumers are now paying much of the cost of purchasing, transporting, and distributing natural gas to industrial users, according to Arthur K. Lee, chairman of the board of United Cities Utilities Company, in a recent statement. This "unfair treatment of 22 million natural gas consumers," said Lee, is being accomplished by the use of a two-part charge by pipeline companies forced upon many distributors in an effort to minimize their over-all gas purchase cost. Lee explained:

> The two-part rate was invented by pipelines in the late twenties when there was little market for gas and, in fact, much was being wasted into the air for that reason. General economic conditions and especially natural gas economics have changed radically since that time. Burning of gas for boiler fuel is wasteful and should be stopped. The two-part rate has outlived its usefulness and must go unless 22 million domestic (residential and commercial) consumers are willing to continue an already large and rapidly increasing subsidy to industrial users in order to compete with the use of powdered coal on a dollar-and-cents basis, which is the only basis upon which fuel is purchased for boiler and similar inferior uses.

According to Lee, the two-part rate works this way: One part supposedly covers the sale of the gas itself and is designated the "commodity" rate. The other presumably represents only the cost of the use of the line and is designated the "demand" charge. It is a monthly minimum charge determined by multiplying the maximum Mcf of gas delivered during any day of the entire year by a definite charge per Mcf set forth in the rate schedule.

As the maximum use takes place during the winter months for residential and other space heating, it is the domestic (residential and commercial) customer who pays this charge.

"THE claim is made by the pipelines that cheap summer sales are necessary in order to keep their lines operating at full capacity the year around, even though the summer gas does not pay its part of the total cost expense," Lee said. "My study during recent weeks convinces me this is not true," he said. The two-part rate may have had its advantages in load building while there was an abundance of gas of little or no field value, but it must be prohibited and a straight "commodity" rate only substituted for three reasons:

1. To stop ever-increasing subsidization of the industrial use of gas by domestic customers.

2. To restore industrial competition with coal and other fuels, and

3. To conserve for domestic use a large proportion of the gas now used for boiler fuel and other inferior uses.

FOR the year ending March, 1957, an FPC release shows cost of gas purchased by interstate pipelines to be .149 cents (March alone .152 cents) per Mcf as against an average in 1954 of .101 cents, an increase in three years of nearly 5 cents. "As 50 per cent of the gas is largely purchased under old contracts for less than .149 cents, it is quite evident that new contract prices, escalations, and renegotiations are spiraling the average upward with increasing rapidity," Lee said.

In a recent case, Lee continued, the FPC granted four large oil company producers a 22-cent to 35-cent price on the ground that the gas was needed for interstate customers. The threat used by the companies was that they would start negotiations for local sale. Sale to interstate lines is the only practical market available and a price much lower than 22 cents for delivery in the Gulf of Mexico would certainly be needed to move large industry away from powdered coal territory. Said Lee:

> It is claimed that this 22-cent to 35-cent price will not trigger costs of gas on the mainland under escalator clauses. This may be true, I don't know. But there is little doubt that if the Harris Bill is passed "reasonable market price" on the mainland will not be less than "reasonable market price" several miles in the Gulf.
>
> In recent rate increase applications by large pipelines all or nearly all the increase is to be applied to the "demand" charge. Despite the fact that proper division of costs by pipeline companies should include cost of gas purchased in the "commodity" part of any two-part rate, these companies have chosen to add those and other increases in costs to the "demand" (residential consumer) part of the rate schedule. . . .
>
> This practice transforms a 5-cent increase in field price to 15 cents for the one-third sold to the domestic consumer. The 22-cent purchase just approved is a 12-cent increase from the 1954 average price and the increased cost of gas for sale to domestic consumers will be roughly 36 cents per Mcf. And the figures . . . of my statement of October 14, 1955, showing an annual increased cost to consumers of over $800 million, if field prices were raised to 25 cents, are perilously near becoming a reality in much less time than I anticipated. If you will multiply present known recoverable reserves of 237 billion Mcf by 12 cents, you will find inventory value of these reserves, at the prices in this contract, have increased over $28 billion!

THIS one contract covers a reserve estimated at as high as 6 billion Mcf of gas, Lee explained. Convert that to dollars at a little less than average price and you have $1.5 billion. It is well known that wells drilled in the Gulf cost immense sums. They may average $5 million per well. Presuming that 10 wells are drilled before a sufficient safe flow is reached to begin initial deliveries, Lee figures that increasing deliveries should pay all additional drilling and operation costs.

The purchaser of this gas is Tennessee Gas Transmission Company. It supplies perhaps 2 million consumers, probably over half of them in New York or New England. "Over a period of years," says Lee, "that means $750 for each and every consumer for gas under this one contract, and the New York and New England consumer will pay two or three times the

added cost allocated to 'demand' in the short distance zone, because that charge is based upon pipeline usage in proportion to distance, by zones, from the field."

The entire contract may, however, be invalidated if the Harris Bill is not passed, Lee points out. If a two-part rate is prohibited by Congress, this and other reserves will be looking for a market for many years at about half this contract price.

The FPC release referred to shows that the pipelines during the year ending March 31, 1957, sold all gas carried (including direct sales) for .273 cents per Mcf. As the purchase price averaged .149 cents, the average carrying charge must have been .124 cents. A rate card is one of the largest pipelines, says Lee, shows a commodity charge in a zone near the field of 13 cents per Mcf, increasing by zones to .243 cents at terminus. The "demand" charge, also increasing by zones, runs from $1.30 to $3.09.

"APPLICATIONS for increase are now pending by this company and several others, but I think it is fair to say that, during the past year, the average charge by all pipelines for commodity has been not less than 20 cents and the average demand charge not less than $2," he said. "As the pipeline is paying 15 cents for the gas and selling it to the distributor for industrial use for only the 20-cent commodity charge, it follows that it only grosses 5 cents to 6 cents per Mcf on interruptible industrial sales . . . as against an average gross of .124 cents. The utility distributor is compelled through the increased demand charge to make up this average. He tries to sell the 20-cent gas to interruptible consumers for all they will pay, but must pass most of it along to his domestic customers."

Presuming that the proportion of gas used as between domestic consumers on the one hand and industrial on the other is roughly the same today as it was in 1955 (less than one-third to domestic customers and more than two-thirds to industrial, including direct sales) Lee's calculation indicates that during the year ending March, 1957, pipelines charged only 5 to 6 cents per Mcf for carrying industrial gas and 21 to 22 cents for domestic gas. This differential will rapidly increase if pipelines are allowed to allocate future increases to residential users only, which is why the new 12-cent increase will cost the domestic consumer at least 36 cents.

THE two-part rate has an even greater impact as between large cities and integrated gas systems on the one hand and smaller nonindustrial cities on the other, Lee continued. The city containing large industries, he explained, plus perhaps local supply and/or storage, may be able (by selling during the summer, fall, and spring cheap interruptible) to purchase the same amount each day throughout the year. It is then rated as having a 100 per cent load factor.

But in a large proportion of cities neither industrial sales, local supply, nor storage facilities are available. This results in a load factor as low as 30 per cent or 40 per cent in such cities. The rate card mentioned above reveals that gas at a 40 per cent load factor would cost per average Mcf, 144 per cent of the cost in a 100 per cent load factor town. But if the distributor can buy his gas on a 100 per cent load factor basis, his over-all cost would be the same as a flat commodity charge. Lee said:

> There are two ways for a large city to achieve a 100 per cent load factor. The two companies serving Chicago and vicinity sell over 75 per cent of all gas sold by utilities in Illinois. They sold

in 1956 roughly 50 per cent of their gas for domestic and similar uses at around $1.08 per Mcf, 16 per cent to firm industrial users at around 60 cents per Mcf and the balance of 34 per cent to interruptible industrials at .275 cents. Their over-all gas cost was thus reduced to the equivalent of a straight commodity rate. The pipeline subsidiaries of Peoples Gas, Light & Coke Company of Chicago have applications pending to increase their rates but in order to avoid any considerable increase of cost to the industrials which would cause them to begin using coal, practically the entire increase is charged to "demand." Peoples alone used last year over 120 billion Mcf and as the field price has increased 5 cents since 1954, Chicago gas must have cost the pipelines an increase of $6 million. Peoples on July 1, 1957, was compelled, because of increased gas and labor costs, to request a rate increase of $11,480,000. If this increase is granted, $200,000 plus small automatic adjustments will be paid by large industrial customers and over $11 million by other customers. That means interruptible industrial rates will be increased .125 cents per Mcf and other rates an average of .084 cents. The increase for small residential use, according to company announcement, will be 20 cents.

New York city and vicinity achieves a 100 per cent load factor purchasing power in another way. The distributors there had established distribution of artificial gas mixed with local natural gas at high prices before long-line gas arrived. The 20 per cent of their gas sold to industry in 1955 for superior (not interruptible) uses paid 78 cents per Mcf and local production and storage facilities are used to achieve a 100 per cent load factor. General use of gas for residential space heating is discouraged by the high prices necessary for small deliveries. The higher price of interstate gas, because of increased distance from the field, also enters into this. The domestic rate averaged $1.47 in the state of New York and as a result the average domestic customer used only about 50 Mcf per annum as against 98 Mcf in Illinois and 182 Mcf in Ohio, where domestic gas sold for an average of 65 cents. Because these conditions make it possible to purchase that portion of their gas needed from interstate lines, on a 100 per cent load factor basis, giving them a favored position as between distributors, officers of Brooklyn Union, Consolidated, and Consolidated Edison have been active in promoting and testifying in favor of the present Harris Bill.

TURNING to the claimed gas shortage, Lee admits that there is a refusal of large and small producers to commit their gas to contract, because they expect pipelines by use of the two-part rate to continue to transfer all additional costs to the domestic consumer.

The annual report of a committee of the American Gas Association shows reserves at December 31, 1956, as 237,000 billion Mcf, and production for the year of 10,900. This would seem to indicate that without finding additional gas we have a reserve which will last twenty-two years at present usage.

"But this 'production' item is a misnomer," Lee said. "It consists partly of production but chiefly withdrawal from reserves. It is true that new reserves are being created in increasing quantities and that the known recoverable reserve has increased every year since figures have been compiled, but the 'production' as used in these reports is a figure governed by the amount of gas which can be sold through

pipelines and utility facilities during the year under consideration."

Here is the way it is built up according to Lee:

1. Much gas is produced in oil fields. This is truly, both from discovery and oil use, a by-product. It was formerly largely "flared"—*i.e.*, burned—in order to prevent its interference with the production of oil. Then it was found that it had a valuable use in the field in repressuring the oil wells, and repeated use of the same gas, cycling, became common. Not all oil field gas is needed for this use. In 1954 oil wells produced 3,500 billion Mcf and used 1,500 for repressuring. There were 700 billion Mcf wasted and lost and 1,500 used in the field for drilling, pumping, etc. Part of the waste and field use took place in gas well operations, but Lee thinks it is fair to say that of the 2,200 so used at least 1,500 was consumed in the oil fields themselves. Thus, while some oil fields contributed considerably to gas production, as a whole their contribution was probably less than 7 per cent of the entire marketed production of 7,000 billion Mcf that year. And Lee is sure that oil field production percentages remain relatively the same today.

But this 7 per cent must be disposed of. There is no storage for it and most states, as a matter of conservation, will not allow it to be wasted.

This approximately 500 billion Mcf is the first item entering into production.

2. According to FPC figures, 26 per cent of all interstate shipments or a little less than 2,000 billion Mcf must be purchased

by pipelines for the use of 22 million domestic consumers and 500 for commercial users. That means that after using the saved gas from oil wells, 2,000 billions had to be taken from new wells or present reserves to take care of residential and commercial customers.

3. The 1955 loss and waste exceeded 2,500 billion Mcf and, assuming a proportional increase in 1956, must have reached 2,800 billion Mcf. Deducting this figure from 10,900 production of 1956, it is found that marketed "production" may have reached 8,100 billion Mcf. Seven thousand three hundred sixty-seven billion were shipped through interstate lines in the calendar year and the lines were kept full by selling around 5,000 billion Mcf to direct customers and utilities at low prices. Evidently around 600 billion Mcf were sold intrastate through other than interstate lines.

It is clear, therefore, that "production" as used simply means the amount of gas which can be marketed at a low figure, subsidized by higher-priced sales to domestic consumers. Lee continued:

> Sale of industrial gas is comparable to the farm subsidy. Twenty-two million residential gas consumers are paying through distributors and pipelines a subsidy similar to that paid on farm products by the consuming public through our government. In the case of farms it may be justified, but there is no justice for the small consumer to be forced to subsidize gas purchases for large and profitable companies. Furthermore, farm products are replaceable, while gas, abundant for many years, is irreplaceable.
>
> A portion of the 7,500 billion Mcf of gas shipped through interstate lines is sold through utilities in the states where produced. The nearly 1,500 billion Mcf so sold for industrial purposes in Texas, Louisiana, Arkansas, and Oklahoma in 1955 by utilities grossed less than 15 cents per Mcf. It is probably fair to presume that the producers received less than 10 cents. Around 600 billion (above) were probably sold direct at that figure or less. Where are the industrials which can afford to move to these states to consume any sizable proportion of this quantity, let alone at a price to compete with a 22-cent to 35-cent contract price?

Just what would be the effect of a one-part charge? Lee explained that the field cost of gas last year was 15 cents. The pipeline charge was .124 cents or an average of .274 cents cost to the direct and utility customer. If the distributor charge to industrial users remained at 5 cents to 6 cents, a considerable part of the interruptible load would be lost and still more would be lost when the pipeline price was increased to take the place of loss from reduced load. It should, however, stabilize with a loss of perhaps half the industrial and direct sales. That would mean that the entire gas sales of pipelines would be reduced to 66 per cent of present sales.

If one-third of quantity were lost, Lee said, "the pipelines could realize the same gross income by increasing their rate from .124 cents to .186 cents, and would certainly make some additional saving in operating expense because of lessened volume. Add to this .186 cents the .149-cent field cost of gas and we arrive at a cost for domestic gas of .335 cents under a straight commodity rate instead of the .363 cents actually paid per that table by utilities." The gas saving would be 2,500 billion Mcf, competition would again be introduced to gas production, and in Lee's opinion, if it were known that this would be a continuing policy, prices would recede

to their 1954 level. Recalling that a Congressman stated on the floor of the House recently that steel is big business and should not increase its prices $6 per ton in face of present conditions, Lee noted that among the twenty largest American corporations, ten are oil and gas companies, while only two are steel. But they expect a far larger proportional increase if the Harris Bill becomes law. Lee said:

> This gas would be conserved for domestic and superior industrial use. This will be strongly objected to by the producer, because he would lose one-third of his sales. But he has contended that he wishes competition to fix his price and the elimination of the two-part rate, supplanted by a straight commodity charge, is the only way to provide real competition between fuels.
>
> After all, why should the one-third of gas carried for superior uses subsidize in an ever-increasing spiral the two-thirds used for inferior purposes? While some railroads carry a few passengers at reduced prices, we wouldn't allow them to carry two-thirds of their passengers at one-quarter price just because they are running their trains in that direction.

LEE thinks a reasonable, effective, and fair way to prevent the sale of gas for less than cost would be to amend the Natural Gas Act (or an amendment to the Harris Bill if it is to be passed) by prohibiting the use of the two-part rate and the purchase and sale of gas by pipelines on year-around contracts and upon a commodity basis only, to both utility and direct customers, with a differential in price only as between customers on a zone basis. Continued increases in producer prices can, with only a flat commodity price existing, be made only with corresponding volume losses and for the same reason pipelines will be compelled to purchase cheaply enough and only in sufficient quantities to allow themselves to meet coal's competition.

"U. S. A. in New Dimensions"

AMERICAN productive power has grown so spectacularly in the past half-century that our economic system must be looked upon in genuinely new dimensions, says a Twentieth Century Fund report issued on July 15th.

As evidence of the kind of growth that is forcing the country to revise its thinking upward, the report shows that in the past fifty years or so average output per hour of work has tripled; consumer spending has more than tripled; average per acre yields of certain farm crops have more than doubled; population has risen from around 75 million to nearly 170 million; and average yearly income per family now stands at more than $6,000.

"The United States has not merely climbed to a new plateau," the report suggests, "but is ascending heights whose upper limit is not yet measurable, and at an accelerated rate of speed."

The report bears the title "U. S. A. in New Dimensions" and is written by Thomas R. Carskadon, associate director of the fund, and George Soule, economist and author, with illustrations by Rudolf Modley. It is based on the Twentieth Century Fund's major study, "America's Needs and Resources: A New Survey," by J. Frederic Dewhurst and associates. The new report carries a foreword by August Heckscher, director of the fund, and it is being published by the Macmillan

Company. The fund's report points out:

> One of our outstanding long-range trends, is the shifting of families and individuals . . . from lower income ranges into higher. In 1935-36 more than two out of every five consumer units had annual incomes of less than $1,000—in dollars of then current purchasing power. . . . By 1950 only 7.6 per cent of consumer units were receiving less than $1,000 annual income. The gains at the upper end of the income scale were even more striking. Almost one-quarter of all consumer units had more than $5,000 income in 1947 and the proportion was nearly 30 per cent in 1950.

INDICATING the size of the market that such incomes and such rates of growth promise for the future, the report says, "If our 1960 estimates are reasonable, American business can look to a consumer market with purchasing power (based on disposable personal income) for goods and services nearly three times as large as in the worst years of the depression, one-third larger than in the peak year of World War II, and nearly one-fourth larger than in prosperous 1950. These estimates are based on dollars of constant purchasing power."

Amid these signs of growth and plenty, the report is careful to point out that "Not all our problems are solved, however. Some Americans are still ill-clothed, ill-housed, ill-fed. Slums and decay blight large sections of our cities, and much remains to be done to take proper care of our natural heritage of land, forest, and water. . . . We cannot be sure by any means that we have abolished depressions or that we will never face hard times or economic trials in the future. And undoubtedly certain industries, occupations, and parts of the country will continue to have difficulties from time to time, even though the country as a whole may be doing very well."

The new report points to rising productivity, meaning increased output for an average hour's work, as the central principle in America's economic advancement and stresses the importance of the use of machine power. Looking back to a century ago, the report says:

> Our net output of goods and services in 1950 was 25 times what it was in 1850, and we did the job with only eight times as many workers. . . .
>
> But we used 74 times as much nonhuman energy. In other words, one man with today's power-driven mechanical equipment can do as much work in forty hours as three men working seventy hours a week with the primitive tools of a century ago. This is the central principle of our success, the secret of our phenomenal rise in productivity.

CARRYING this principle into the future, the report estimates that "American productivity . . . is increasing so rapidly that if present rates continue, in another century we shall be able to produce as much in one 7-hour day as we now produce in a 40-hour week."

Noting similar advances in agriculture, "U. S. A. in New Dimensions" declared:

> At mid-century the big fact about America's farms is that they have shared, along with business and industry, our country's spectacular advances in ability to produce.
>
> We now have actually fewer farmers in this country than we had in 1910. In that year we had a population of around 92 million, whereas in the middle 1950's our smaller number of farmers were producing more than enough for our population of more than 165 million.

One striking result of our growth in ability to produce is a shortening of working hours and greatly increased leisure. As the new report puts it, "While American productivity has steadily gone up, working hours have steadily gone down, from an average of about seventy hours per week in 1850 to the 40-hour week of today.

"Leisure time for recreation for the average employed American has nearly doubled since 1900 and seems likely to increase still further. Figures indicate that since 1910 as our national productivity has increased we have tended to take about two-thirds of the possible gain in the form of goods and services, and one-third in shorter working hours and increased leisure. Long-term trends indicate an average workweek perhaps as low as thirty-seven and one-half hours in 1960."

SURVEYING our economic system as a whole, "U. S. A. in New Dimensions" speaks of "our fundamental assets: the energy and spirit of the American people; our vast physical plant made up of the land and resources of nature plus man-made structures and equipment of every kind; and our democratic system that guarantees political and economic freedom to all. With these ingredients we have made giant advances. In America today our income per person is higher than that of any other country and probably five times the average for the world as a whole."

In looking at America's natural resources of land and minerals and forests and water, the new report strongly urges sparing use and intelligent conservation of our basic assets. On the other side of the equation, the report says:

> Yet we have more, much more, than simply a central store of raw materials which, once used up, will be gone forever. Out of our laboratories and factories comes a steady stream of fibers, substances, materials created to order. It is almost literally true that if you give the specifications of any wanted material—strong as steel, flexible as rubber, light as balsa, washable as cotton, heavy as lead, hard as a diamond—in any combination, technology will create it for you. And modern technology will use such ingredients as air, water, sand, vegetable pulp, and metals from the sea, which are available in almost limitless quantities.

The whole forecast of the American future is based on our continuing advances in technology, which is defined as "our accumulated knowledge, techniques, and skills and their application in creating useful goods and services." As the report puts it, "Technology is our primary resource. Without it, all other resources would be economically nonexistent."

"U. S. A. IN NEW DIMENSIONS" speaks of new energy sources such as atomic power and sun power and their importance to the country's future. It describes the trend toward automation and more and more complex machines, and, looking to the future, says:

> In the long run machines create more jobs than they destroy. Our record of the past half-century shows that in spite of general depressions, as well as difficulties in certain localities and certain industries at certain times, we have enjoyed a vast increase in the amount and variety of goods and services available to our people as a whole. And at the same time we have had not fewer jobs but a steady rise in both the number and proportion of our people in gainful work, a rise in real income and a steady shortening of the workweek. Our long-term trend is unmistakably upward.

The March of Events

ABA Utility Section Meeting

COINCIDENT with the eightieth annual meeting of the American Bar Association, the Section of Public Utility Law held its first session on Thursday, July 11th, at the Ambassador hotel, New York city. Chairman of the section, Donald C. Power, president of the General Telephone Corporation, presided. The 1957 sessions of the section were divided into two parts, those in New York city being held July 11th to 13th, and those in London slated to be held in the Thames Room of the Hotel Charing Cross, July 25th.

At the New York session on July 12th pending natural gas legislation to exempt producers from Federal Power Commission jurisdiction was discussed. William E. Torkelson, chief counsel of the Wisconsin Public Service Commission, presented the consumer's point of view, William A. Dougherty, New York attorney, discussed the distributor's point of view, while George W. Hazlett, Cleveland attorney, presented the producer's viewpoint.

The afternoon session of the same day was held jointly with the Section of Administrative Law. The joint session heard addresses by Captain E. V. Rickenbacker, president, Eastern Air Lines, and John W. Cragun of Washington, D. C. J. W. McAfee, president of Union Electric Company of Missouri, and Starr Thomas, general attorney for the Atchison, Topeka & Santa Fe Railway Company, discussed administrative law from the public utility point of view.

The session on Saturday, July 13th, was devoted to a discussion of the section's annual report on developments during the year in the field of public utility law. W. James MacIntosh, of Philadelphia, chairman of the Standing Committee, presented the report. J. K. Busby, executive vice president, Pennsylvania Power & Light Company, spoke on atomic energy problems. James R. Durtee, presented the report. Jack K. Busby, spoke on air transportation problems. William R. Connole, member of the FPC, spoke in place of FPC Chairman Jerome K. Kuykendall, who had to remain in Washington in connection with the Senate consideration of his renomination to the FPC. Commissioner Connole discussed cost and field price value questions in pending gas legislation, the right of a utility to reject accelerated depreciation for taxes, and the probability that the FPC would use some method for determining producer costs on the basis of areas or groups. Owen C. Clarke, chairman of the Interstate Commerce Commis-

sion, discussed surface transportation problems.

The text of papers delivered at the section's sessions will be carried in a special appendix, as usual, in a forthcoming issue of PUBLIC UTILITIES FORTNIGHTLY. The addresses before the London sessions will be noted in a subsequent news review.

Before it adjourned for the trip to London, the section elected the following officers: Randall J. LeBoeuf, Jr., well-known New York city attorney, chairman; John B. Prizer, vice chairman; Francis X. Welch, editor of PUBLIC UTILITIES FORTNIGHTLY, secretary; and C. William Cooper, New York city attorney, chairman of the Standing Committee. New members elected to the section's council were: George L. Buland, San Francisco; Stephen H. Fletcher, Washington, D. C.; Jack K. Busby, Allentown, Pennsylvania; and W. James MacIntosh, Philadelphia.

Gas Legislation

APPROVAL by the House Interstate Commerce Committee of legislation easing federal controls over natural gas producers practically assures House action at this session of Congress on this controversial measure. But the narrow vote (15 to 13) clearing the Harris-O'Hara Bill for House consideration probably foreshadows a similar close vote on final passage. Chairman Harris (Democrat, Arkansas) has refused to predict the outcome, while opponents of the measure seem confident of enough votes to defeat the bill.

House Speaker Rayburn (Democrat, Texas), who expressed hope that the bill would be brought upon the floor this year, conditioned its passage on all-out support by the administration. The inference was that the House Democratic leadership would not go out of its way to aid in passage of the bill unless the administration takes full responsibility for it.

The bill was reported from committee in substantially the same form as introduced by Representative Harris. Neither of the two amendments suggested by the administration during the hearings on the bill was adopted. One of these would have permitted the Federal Power Commission to consider a cost base in fixing producer rates. The other would have authorized the FPC to change escalator clauses in existing gas supply contracts. The only major change in the bill was a provision aiding industrial consumers by allowing refunds when the FPC finds a pipeline's rates too high. At present, the FPC has no authority to regulate direct sales to industrial users.

Representative Harris disclosed he had been "reliably informed" by the administration spokesmen that the bill has White House approval as voted out of committee.

The committee voted down, by solid margins, (1) a substitute measure sponsored by Representative Torbert MacDonald (Democrat, Massachusetts), and (2) a motion to table the Harris-O'Hara Bill offered by Representative John Heselton (Republican, Massachusetts). The vote on the MacDonald Bill to retain federal regulation over large producers only was defeated 19 to 11. The Heselton motion was killed by an 18-to-12 vote.

Representative MacDonald saw the final two-vote margin as an indication that the bill would run into trouble in both the Rules Committee and on the House floor. He predicted the measure would be "easily" defeated in the House.

"This is an altogether different kind of a bill than we had in the last Congress, as indicated by the vote," Representative Harris declared. He referred to the fact that the FPC would review rate increases, although not from a cost standpoint. The Harris-Fulbright Bill would have freed

gas production from any federal review whatsoever.

Representative Harris said majority and minority reports on the new bill would be published by the committee. He said it would then be up to the House leadership to get it through the Rules Committee to a vote by the House.

Arkansas

Starts New Gas Price Study

A RESOLUTION adopted by the state public service commission last month directed its staff to determine the fair field price of all natural gas utilities operating in the state. Commission Chairman Lewis M. Robinson said the study definitely would not result in rate increases for the gas companies. W. R. Stephens, board chairman of Arkansas Louisiana Gas Company, said that "under no circumstances" would it mean higher rates for domestic customers of his firm.

The commission said it was ordering the study because of a 1957 state legislative act legalizing the fair field price theory of regulation in Arkansas. The commission used this theory rather than the traditional rate base method of figuring the cost of produced gas to authorize for Ark La the 1955 increase in rates for its large industrial users. The increase was appealed to the state supreme court which early this year held that there was no legal authority for using the fair field price method.

California

PG&E Plans to Import Gas from Canada

PLANS to construct a $330 million pipeline system to transport natural gas from Canada direct to California were announced recently by Norman R. Sutherland, president and general manager of Pacific Gas and Electric Company. The international project would connect the continually expanding California market to important new resources of natural gas in the Province of Alberta, thus adding substantially to supplies from other sources required to meet the mounting fuel and energy needs of the state.

A substantial quantity of gas has been purchased for the project by a recently organized Canadian subsidiary of the company, Sutherland said, and negotiations for the purchase of additional gas are in progress.

The project will require authorizations of governmental agencies of Alberta and of Canada, of the Federal Power Commission, and of the state public utilities commission.

Initial deliveries of 400 million cubic feet a day are planned for 1960.

Delaware

Phone Rates Suspended

DELAWARE'S public service commission on July 10th suspended until October 17th the Diamond State Telephone Company's request for higher rates. The company had filed a petition asking for ap-

proval of rate increases, effective July 21st.

Since the commission reached no final decision on the proposed increase, the company may now legally raise its rates automatically, but the higher rate would only be temporary and subject to reversal later. Hearings will be conducted by the commission.

In order to put the rate boosts into effect ahead of a final commission decision, the company announced it would post a bond of about $1,880,000 to cover possible subsequent refunds.

Pennsylvania

Studies Gas Rate Pleas

THE state public utility commission last month rejected a request by Manufacturers Light & Heat Company, Pittsburgh, for an immediate $1,523,000 annual natural gas rate increase. The commission also suspended proposals by two other western Pennsylvania utilities to raise gas rates by $1.5 million a year.

Besides Manufacturers, increases were asked by Peoples Natural Gas Company, Pittsburgh, and North Penn Gas Company, Port Allegheny, to offset raises in the wholesale price of natural gas purchased from pipeline firms. Peoples sought a $1,269,149 increase July 15th, while North Penn wanted a $229,702 boost, effective July 22nd. Both were suspended for six months from those dates pending investigations. The commission said hearings would be opened as soon as possible.

The commission currently is conducting hearings on a $6,479,000 increase which Manufacturers wanted to put into effect last May for its 247,000 consumers in 25 counties. Filed in two parts, the increase is under suspension until November 12th-13th. Pending completion of the hearings and a final order, Manufacturers asked the commission to lift suspension of one increase totaling $1,523,000, which it said is designed to recover the higher cost of gas. The commission denied the request and will continue to consider it at further hearings along with the second proposed increase of $4,956,000.

Washington

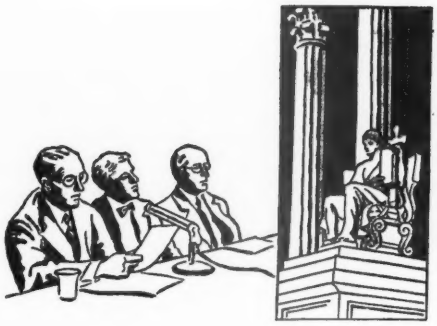
Rocky Reach Dam Licensed

THE Federal Power Commission recently issued a 50-year license to Public Utility District No. 1 of Chelan County for its $225,772,000 Rocky Reach hydroelectric project on the Columbia river in Chelan and Douglas counties, Washington.

The commission did not impose a condition, as requested by Public Utility District No. 1 of Douglas County that would have required the licensee to reimburse the future owner of the potential Wells project for loss of power caused by overlap of the Wells tailwater by the Rocky Reach pool.

The commission originally granted the license to the Chelan district in July, 1956, but the order was remanded to the commission for further study by the U. S. court of appeals.

Under an agreement, part of the construction costs of Rocky Reach dam on the Columbia river near Wenatchee will be paid for by the Aluminum Company of America in return for a contract allowing Alcoa to purchase part of the power to be generated by the dam.



Progress of Regulation

Trends and Topics

Partial Acceptance of Field Price Theory

CONGRESSIONAL committees have been examining proposals for easing federal controls over natural gas producers since the Supreme Court, in the Phillips case (3 PUR3d 129), decided that they are subject to regulation under the Natural Gas Act. Not much progress has been made in gaining acceptance of the fair field price theory under federal regulation, but in Arkansas the story is different. After judicial reversal of a rate order based on fair field price, the legislature passed a law legalizing the fair field price theory of rate making, and the governor approved (PUBLIC UTILITIES FORTNIGHTLY, March 28, 1957, page 485).

The early history of the fair field price theory of rate fixing for natural gas was reviewed in PUBLIC UTILITIES FORTNIGHTLY, December 22, 1955, page 1051, following its acceptance by the Federal Power Commission in the Panhandle case (3 PUR3d 396) and by the Arkansas commission in the Arkansas Louisiana case (10 PUR3d 407). Both of those decisions were overruled. A federal court remanded the Panhandle case (11 PUR3d 113), and the Arkansas supreme court upset the state commission rate order (18 PUR3d 13).

Departure from Rate Base Method

The federal court did not forbid the use of the field price method. Allowance of the field price for gas produced, said the court, is not unlawful merely because it departs from the traditional rate base method, but such an innovation must not lift the rates above the just and reasonable standards of the Natural Gas Act (11 PUR3d 113, 120). The commission, in the Union Oil Company case, said that from the court's language it was plain that the value method used alone was not a method of rate making open to the commission within its delegated power. Even though the rate base method is not the only one available, it is essential as a basis for comparison (16 PUR3d 112). There must also be evidence that increased rates are no higher than necessary to en-

courage exploration for and production of known and future gas reserves. The commission, denying a rehearing in the Union Oil case, could find no reason for excluding independent producers from the law laid down by the court (17 PUR3d 291).

An explanation and justification of the Federal Power Commission's dismissal of the application by Union Oil Company of California for a rate increase is reported in PUBLIC UTILITIES FORTNIGHTLY, January 17, 1957, pages 109 and 123. The case was dismissed because the evidence submitted was limited to arm's-length bargaining and fair field price of gas (16 PUR3d 112). Commissioner Connole said that, under the court ruling in the Panhandle case (11 PUR3d 113), the commission had no choice but to rule as it did.

The commission reiterated its views in the Forest Oil Corporation decision (18 PUR3d 233). Statements by expert witnesses that increased rates were needed or desirable as an incentive for exploration and production were not enough. It was said to be essential that the conventional rate base method be used at least as a basis of comparison or point of departure. The company must then produce evidence supplemental to evidence of arm's-length bargaining and of market value. Therefore under federal law, it seems, fair field price evidence is acceptable but not sufficient alone to support a rate.

Fair Field Price in the States

Even though fair field price be accepted, along with other evidence, in federal cases, state laws may have to be changed to permit its being considered locally. The Arkansas supreme court distinguished decisions under the Natural Gas Act by pointing to the facts that (1) in the Panhandle case the party seeking higher rates was an independent pipeline company while the Arkansas company was a public utility, operating under an exclusive franchise, (2) the relationship of the parties was not the same; the Arkansas company bore a trustlike relationship to its customers, (3) the two situations were not governed by the same statutory provisions; the Federal Power Commission need only "protect consumers against exploitation at the hands of natural gas companies," while in Arkansas the commission must fix "the lowest possible rate commensurate with" a fair return (18 PUR3d 13, 21).

But as noted above, the Arkansas commission accepted the fair field price method, the court reversed, and the legislature passed a new law legalizing it. Then the state commission, in the Fort Smith Gas Corporation case (18 PUR3d 306), considered itself bound by the new law to recognize, as an operating expense, the fair field price theory with respect to gas purchased from an intrastate producer.

The commission disclaimed authority to pass upon the reasonableness of the price paid for gas purchased from an interstate company subject to regulation by the Federal Power Commission. Apparently it is established law that states must yield to federal control. The Supreme Court, for example, decided that the Oklahoma Corporation Commission could not fix a minimum price to be paid by an interstate pipeline company for natural gas to be transported for resale, in view of the exclusive jurisdiction of the FPC (8 PUR3d 7).

PROGRESS OF REGULATION

Field Price under Escalator Clause

Although a federal court upheld the action of the Federal Power Commission in rejecting increased producer rates for failure to comply with provisions of the Natural Gas Act, the court recognized "prevailing field price" as a basis for prospective adjustment of prices. The contract between a producer and purchasers of gas established initial rates and provided for adjustments based upon prevailing field prices at the wellhead. The court said that while it was not free from doubt, it was inclined to agree that the yardstick for the determination of such prices was sufficiently definite. What is the prevailing field price is a question of fact which can be readily ascertained, and any method which would fairly reflect such price "would be a proper yardstick under the contract" (13 PUR3d 414).

Review of Current Cases

Retail Gas Companies Have No Standing to Challenge Rate Form Change of Indirect Supplier

THE U. S. circuit court of appeals ruled that two retail gas companies had no standing to seek review of a Federal Power Commission order which permitted their direct supplier, Central Kentucky Natural Gas Company, and their indirect supplier, United Fuel Gas Company, to change the latter's demand-commodity rate form by providing for a long-term contract demand.

Under the new form the billing demand would not exceed, nor be less than 90 per cent of, a quantity of gas to be agreed upon by the seller and buyer as an estimate of the buyer's maximum-day requirement during a 20-year contract. The old rate form provided for annually ascertained peak demand. The commission's order was limited to the contract demand element, and proposed increases in demand and commodity charges were reserved for a future hearing. The rate level would not be affected.

The primary fact impelling the commission's decision was the sharp increase in the space-heating load in the area served by the distribution customers of United Fuel and Central Kentucky. Under the old rate form the design capacity of these two companies was being utilized only once in approximately every eight years. Annual weather variations resulted in uneven collection of costs through demand charges. The newly authorized long-term contract demand would tend to stabilize recovery of costs. The commission did not think a long-term commitment was unreasonable, considering that it was subject to continual administrative scrutiny. It specifically found that further use of the old rates would not be in the public interest.

Aggrievement Based on Economic Change

The retail companies indicated that they would not object to a short-term (such as one year) contract demand form, but they asserted that the order unlawfully required them to pay Central Kentucky minimum demand revenues over a long term even though their gas requirements

might be curtailed by drastic economic changes in the gas industry. They did not attempt to show, however, that such changes would occur in the foreseeable future.

The court thought it was clear that these companies did not complain of any present injury from the long-term billing commitment provision. They were not aggrieved, within the meaning of the Natural Gas Act authorizing appeal by aggrieved parties, merely because unforeseeable economic changes might occur during the contract term, the court of appeals stated.

The retail companies, which operated electric facilities as well as gas property, also claimed they were aggrieved because the commission refused to exclude their electric assets and revenues from liability for gas debts incurred through the operation of the billing commitment. The court noted that these companies could easily remedy this difficulty by incorporating their departments separately if they wished.

Furthermore, it was observed, the electric revenues and assets would not be called upon by gas creditors unless the gas industry became a sick one—a contingency too remote and speculative to be the basis of rejecting the long-term billing commitment. Therefore, on this score, also, the companies were not presently aggrieved.

Finding on Public Interest Adequate

The petitioners further contended that they were aggrieved because the order unlawfully changed the gas service agreements between the two suppliers without a finding, as required by the Natural Gas Act, that such agreements adversely affected the public interest. The court indicated that this condition had been amply met by the commission's finding that "further use of these rate forms [those previously prescribed] would not be in the public interest." It was immaterial that the commission began the investigation to inquire into the reasonableness of the contract demand rather than the reasonableness of the previous rate form. *Cincinnati Gas & E. Co. et al. v. Federal Power Commission, No. 13,515, June 3, 1957.*

Aggrievement Based on Higher Rates

In another case Dayton Power & Light Company, a distributing company and an indirect purchaser from United Fuel, was similarly held to have no standing to seek review of the order. Dayton does not purchase gas from Central Kentucky but is supplied by Ohio Fuel Gas Company, which in turn obtains its supply from United Fuel.

This retail company alleged that the new rate form was unreasonable, resulting in higher rates to Ohio Fuel. The court observed that the new rate form would not in fact result in a higher rate level to Ohio Fuel. But even if it should have that effect, it was not alleged, nor did it otherwise appear, that a higher rate would be imposed upon Dayton. Nor was any claim made that Ohio Fuel, because of the challenged order, would seek to introduce the contract demand component into the rate under which it supplies gas to the appellant. If and when Ohio Fuel should attempt to do so by filing an amended tariff, Dayton would have ample opportunity to protest and be heard, with further opportunity for judicial review.

But at the present juncture of the case, the court pointed out, Dayton Power & Light had no immediate concern in the matter and was not an aggrieved party within the meaning of § 19(b) of the Natural Gas Act. *Dayton Power & Light Co. v. Federal Power Commission, No. 13,525, June 3, 1957.*

Court Upholds Rate Increase Order Despite Lack of Value and Return Findings

THE Pennsylvania superior court has affirmed a commission order increasing a water company's rates approximately 19 per cent, although commenting that the propriety of instituting several proceedings within a relatively short period of time, each involving a substantial percentage increase, is questionable.

Rates are established to operate in the future, said the court, and they should be permitted to remain in effect for a reasonable period unless an unforeseen or extraordinary condition arises which warrants a new increase. Moreover, consumers may be required to bear the costs of the utility in a rate case. Frequent proceedings, instituted merely because of some increase in the value of a utility's property or because there may be some fluctuation in operating costs, are not compatible with the public interest.

When Fair Value Findings Necessary

The appeal hinged upon the question of when the commission was required to make specific determinations of fair value and fair rate of return. The commission had established a minimum reproduction cost but had not made any findings of fair value. After determining operating expenses, annual depreciation, income taxes, and operating revenues, the commission had found that the income available for return, capitalized at 6 per cent, indicated a rate base that could not be said to be in excess of any fair value.

When the commission imposes rates upon a utility or determines that the existing or proposed rates are unreasonable or in violation of the law, held the court, it is essential that a finding of fair value be made. However, where the rates are found to be just and reasonable, the commission may refrain from making specific findings of fair value and fair rate of return if the evidence before it is sufficient to enable it to reach that conclusion without making such specific findings, and if the evidence also indicates that the fair value would be in excess of any amount necessary to support the rates.

A logical test to determine if findings are not essential is whether the evidence shows the return to be "obviously reasonable." Regardless of any standard, no single rate of return is applicable to all utilities, said the court. The test is not whether the utility's view of the evidence indicates that the return is obviously reasonable, but whether it is obviously reasonable as the commission has finally determined the matter.

The court observed, without approving any formula, that the commission had been inclined to establish a definite finding of fair value, when one was made, at a point near the average of original cost depreciated and reproduction cost depreciated. If the commission had capitalized the return at 4.6 per cent, the indicated rate base arrived at would have been the mathematical average of original cost depreciated and minimum reproduction cost depreciated. The commission had not erred in concluding from the adjusted and modified measures of value that the rates under the proposed tariff were lawful under any reasonable minimum finding of fair value.

Reproduction Cost Evidence

The city opposing the commission's action contended that the commission had found certain infirmities and limitations in the utility's reproduction cost estimate, leaving only original cost as evidence of fair value. The court agreed that part of

the reproduction cost evidence submitted was admittedly unorthodox with respect to the manner in which it had been prepared.

Ordinarily, reproduction cost is based upon spot prices at the cut-off date and at the average price levels for periods of several years. The utility had used a trended reproduction cost method in the present proceeding. The commission had taken account of inherent weaknesses in estimating the reproduction cost, and had said that a reproduction cost estimate based on some previous price level properly trended to present-day price levels was a mathematical equivalent of a reproduction estimate made *de novo* at present-day prices. The company's reproduction cost evidence had been adjusted subject to the limitations found, and the commission had concluded that although it was unable to make definite findings of reproduction cost, the evidence was such as to allow it to find the minimum reproduction cost depreciated.

The city's argument that it was inconsistent for the commission to make a minimum finding of reproduction cost in view of its statement that it could not make a definite finding of reproduction cost appeared to the court to be unfounded, since the commission had noted certain defects in the evidence which required adjustment and the minimum reproduction cost found was accurate enough to determine whether the rates were just and reasonable.

Accrued Depreciation Method

The city also condemned the method used by the commission in arriving at accrued depreciation. The commission had held that the utility erred in using the average age and average life of property in estimating the accrued depreciation by the 4 per cent compound interest method, and that it had resulted in an understatement of the accrued depreciation. Accordingly, the commission had increased the amount of accrued depreciation by applying judgment figures, based upon the evidence submitted.

The court held that the commission had properly considered the results of the application of the compound interest method as guides merely, rather than as absolute measures of accrued depreciation. The commission, within the sphere of its authority, could have accepted the utility's book reserve if convinced of its reliability and accuracy.

The commission, however, was not bound to accept any particular method in estimating accrued depreciation and depletion. The fact that the book reserve showed a higher or lower amount than the reserve requirement study had no effect on the principles applicable to the administrative finding, which the court was bound to uphold if based on substantial evidence. *City of Johnstown v. Pennsylvania Pub. Utility Commission, June 11, 1957.*

Coal Interests Lose Appeal Challenging Gas Sales for Boiler Fuel

THE court of appeals affirmed a Federal Power Commission order authorizing Northern Natural Gas Company to extend its facilities a short distance and furnish interruptible service to Northern States Power Company at its Black Dog Lake generating plant in Minnesota. The order was challenged by coal interests seeking to block the power company's use of gas for boiler fuel.

The coal interests complained that Northern Natural failed to show that the

service was required in the public interest, or that the proposed price would return its properly allocable costs. The court found that the gas company had an adequate supply from which to make the newly authorized interruptible deliveries. It also found that such sales would lower unit costs by improving the load factor. Furthermore, the power company would enjoy reduced fuel costs, to the ultimate benefit of its retail customers.

Evidence supported the commission's finding that Northern Natural would derive a net profit from the interruptible deliveries after deduction of the incremental cost of service specifically attributable to them. That the proposed price would exceed the established commodity charge was considered a sufficient check on the evidence underlying the commission's finding. The court thought an allocation of system-wide costs was unnecessary in this case.

Since the order was based on findings sustained by evidence, and no procedural error appeared, the court refused to interfere with the administrative evaluation of the public interest. That function, said the court, is committed to the commission's judgment. *National Coal Asso. et al. v. Federal Power Commission et al. No. 13,582, June 20, 1957.*

Application for Subpoena *Duces Tecum* Too Broad

THE Federal Power Commission denied an application for issuance of a subpoena *duces tecum* directing Union Oil & Gas Corporation of Louisiana to produce all working papers underlying the financial and statistical data included in Union's rate filing. The application alleged that the working papers were necessary, among other things, to ascertain the nature and basis for a proposed increase in rates, whether the use of certain averages were a reliable basis, and whether a redetermined price of gas was in fact based on comparable sales of gas, and the reasonableness of allocations of expenses.

The company opposed the application, contending that the request was premature, vague, general, and "sweeping" in nature, and, further, that the company should not be required to make disclosure of confidential business information. The commission said that its staff was presently conducting a field investigation of the company's books and operations and that the company would present its testimony and evidence purporting to support its proposed increase.

The commission carefully reviewed the extent of the subpoena requested and decided that it did not conform to the requirements of § 14(c) of the Natural Gas Act and § 1.23 of the Rules of Practice and Procedure. This section of the rules provides "specification" shall be made of the documents desired and the facts to be proved by them "in sufficient detail to indicate the materiality and relevance of such documents." *Re Union Oil & Gas Corp. of Louisiana, Docket No. G-11563, April 18, 1957.*

More "Equitable" Contract Interpretation No Basis For Deposit Refund

THE New Jersey commission dismissed a complaint which had been brought to require a water company to refund the balance of a deposit paid to secure a serv-

ice extension. The complainant admitted that he voluntarily executed the contract with full knowledge of all its terms and provisions. He claimed, however, that the contract should be construed inequitable because it did not provide for interest on the deposit and refunds based upon additional extensions. Furthermore, he had had no option but to sign the contract form submitted by the company if he was to obtain service for the homes he was building.

The evidence indicated that the terms of the contract accorded in all essential respects with those offered other developers who applied for extensions. The contract conformed to the commission's rules and regulations governing extensions.

The commission concluded that there did not appear to be any dispute concerning compliance by the company with the terms of the contract as written. The case evolved into a request by the complainant for a variation of the terms and provisions of the contract, as written, to a basis which he regarded as more equitable. He wanted an order, pursuant to the suggested variation, that the company immediately refund the balance of the deposit with interest.

The ultimate relief requested, held the commission, is the rendering of a judgment specifically enforcing a contract in a manner which accords with the suggested interpretation. The board did not have judicial power to do this. The relief prayed for appeared to lie within the jurisdiction of the courts rather than with the commission. *Tarrant v. Plainfield-Union Water Co. Docket No. 9925, June 5, 1957.*

Order Upholding Telephone Company's Refusal To Lease Wires Reversed

MODERN judicial eyes took a new look at the Holmes case, PUR1920E 75, when a commission order dismissing a complaint by businesses against a telephone company came up for review. The New York supreme court held, in reversing the dismissal, that a business firm, by leasing wires to transmit signals from burglar alarms to the protective company's offices, was not engaging in the telegraph business and was not subject to regulation under the Transportation Corporations Law.

The commission's dismissal of the complaint had been based on the theory that the businesses were not entitled to use wires in the public streets as an adjunct to their business.

The Holmes case had held that a company incorporated in 1883 under the Telegraph Law, and maintaining a burglar alarm system whereby the unauthorized opening of a window or door registered an alarm in the central office by means of electrical wires, was a telegraph company. As such, it had a right to use the streets and subways of New York city for electrical conductors without interference from the local authorities.

Misconception of Holmes Case

A misconception as to the effect of the Holmes decision may have arisen from some language used in one of the majority opinions, said the court. For instance, it had been said, "All telegraph messages are but electric signals having well-understood meanings. A burglar telegraphed his entrance. He sent his message over a wire. That his act was involuntary and unconscious made it none the less a telegraph message."

This language, pointed out the court, must be read in context with, and in the light of, the issue before the court in the Holmes case; *i.e.,* whether the plaintiff, incorporated as a telegraph company, was engaged in the telegraph business in the use of its own wires. The court had not intended to hold that every business house leasing a wire for its own private signaling purposes becomes engaged in the telegraph business within the meaning of the Transportation Law. Because a burglar might involuntarily telegraph his unlawful entrance over a leased wire, it did not follow that either the owner of the protected establishment, or the burglar alarm company, was engaged in the telegraph business.

If that were so, then no business house or individual could lease a wire for private purposes unless incorporated under such statute.

This was contrary to ordinary usage and practice. It is a matter of common knowledge that telephone wires are leased to various business houses, organizations, and individuals who use them for their own private purposes and are not classed as public service corporations. The court could perceive no difference in principle that required placing telegraph wires in a different category as a matter of law. Of course, said the court, there was a theoretical possibility that the lessees of any private wire might use it for a service that belongs only to a public utility, but this danger appeared rather remote and easily discoverable.

Actions Inconsistent

The evidence showed that the company, for the past few years, had refused requests for leased wires in connection with burglar alarm systems which would terminate at an answering bureau other than a police station. It had, though, leased some 27 wires for the same purpose which terminated at answering bureaus in the counties of Bronx, Kings, Queens, and Nassau, and those wires were still operating at the time of the hearing. The company explained the inconsistency on the grounds that the matter had not come to the attention of the general headquarters until some time had passed. If a rule of exclusion is to be applied against one private user, it should be applied against all, said the court. Otherwise, the door is open to arbitrary discrimination.

The telephone company is a public utility already under the regulatory jurisdiction of the commission, and the legislature has evinced no intent to require duplicate regulation for the users of leased wires, held the court. The significant point of distinction between the present case and the Holmes decision is the ownership and maintenance of the wires under public regulation, and not the mere use thereof. Although the commission's determination could not be classed as arbitrary or capricious in view of a previous court decision based upon a misconception of the Holmes case, the commission, nevertheless, was directed to reconsider the matter. *Owl Protective Co., Inc. et al. v. Feinberg et al. 161 NYS2d 810.*

Telephone Extension from "Trade Territory" Exchange

THE Missouri commission denied a request for telephone service from a certain exchange. Survey areas defining present boundaries of two exchanges, pointed out the commission, become effective by operation of law when approved by the commission. As such, they are binding on all concerned, including the com-

mission, the companies, and persons desiring service unless the commission finds them to be arbitrary and unreasonable.

Boundary lines of telephone service areas must be fixed at definite locations. It is inevitable that certain persons will be served by a particular exchange and their neighbors by another. This alone, however, does not result in undue preference for, or discrimination against, any person. Unless exceptional circumstances are shown, one company should not be permitted to invade the service area of another.

"Trade territory" is one of the factors to be considered in passing on the question of public interest for service from a particular exchange. However, it cannot be a controlling factor because trade territories change over periods of time and telephone companies should not be expected to change boundary lines where trade territories of subscribers change.

The exchanges involved in the instant case were owned by different companies. The company presently serving the area showed, by uncontroverted evidence, that excluding the persons involved in the case would jeopardize chances of obtaining an REA loan, which, in turn, would affect telephone service to remaining subscribers. *Re Orton et al. Case No. 13,623, June 3, 1957.*

Small Water Company Return Allowance

In this era of largeness, small utility rate decisions are often overlooked. The basic principles governing return and rate questions, however, are applicable to all utilities, regardless of size. The New Jersey commission recently authorized a small water company to increase rates so as to produce a return of 6 per cent, which was considered reasonable.

The record showed that at December 31, 1956, the company's investment in fixed capital less reserve for depreciation was $8,673. During 1956 a new reservoir had been installed at a cost of approximately $6,000.

In 1956, the company had revenues from the sale of water in the amount of $1,413 and a rebate of $50 from the county.

Its operating revenue deductions were $1,318, resulting in an operating income of $145. This amount, when related to the rate base found by the commission, produced a return of less than 2 per cent.

Depreciation would increase $57 annually because of the increased investment in the reservoir. The company estimated that the proposed rates would produce operating revenues of $2,900, that its operating revenue deductions would be $1,875, and that operating income would be $1,025. This operating income would result in a rate of return of 11.8 per cent.

The commission found that, on a rate base of $8,673, a return of 6 per cent would be reasonable, considering the company's operations and territory served. *Re Long Valley Water Co. Docket No. 9950, May 28, 1957.*

Failure to Show Emergency Brings Denial of Interim Water Rate Relief

Despite predictions of a meager return on its water properties in 1957, the California commission denied interim rate relief for the water operations of a mul-

tiple service company. It was alleged that earnings would become inadequate and confiscatory in view of increased construction and mounting operating costs. Interim relief was said to be necessary in order to obtain capital funds on reasonable terms. But from the company's own showing it appeared that over-all operations in 1956 afforded a return of nearly 6 per cent and that the water department earned 4.8 per cent for the same period.

The commission observed that the company asked for interim relief based solely on its own showing without full cross-examination of its witnesses and before showings by the commission staff and interested parties could be made. Proof that a present financial emergency exists, said the commission, is a lawful condition precedent to the granting of an interim rate increase.

The necessity of a *present* emergency was emphasized. In this respect the company's showing was wholly inadequate. The record contained no proof of a present emergency resulting from the financial position of the utility. *Re Citizens Utilities Co. of California, Decision No. 55137, Application Nos. 38662, 38663, June 18, 1957.*

Erection of Transmission Line Near Dwelling Held Lawful

In affirming a commission order approving an electric company's application to acquire a right of way for a transmission line, the Pennsylvania superior court decided a question relating to the proximity of the line to a dwelling house.

The pertinent statute provides that an electric company may appropriate property for transmission of electricity, "except that . . . a dwelling house or the reasonable curtilage, not to be less than three hundred feet, appurtenant thereto, shall not be appropriated . . ." The proposed line would be somewhat less than 300 feet, but between the dwelling and the proposed right of way there were a road and a railroad right of way.

It was contended that a right of way could not be appropriated within 300 feet of the dwelling under any circumstances. The court disagreed, pointing out that the statutory words "appurtenant thereto" described the reasonable curtilage, which is ordinarily land contiguous to the dwelling. The evidence in the case did not show that the land sought to be appropriated was in any way necessary to the dwelling. Rather, it was severed from the dwelling and curtilage appurtenant thereto by the public road and the railroad. It was a separate parcel of land and not within the protective provision of the statute. *Charch v. Pennsylvania Pub. Utility Commission, No. 159, June 11, 1957.*

Utility's Routing of Transmission Line Upheld Over Objection of Landowner

Following the Pennsylvania commission's approval of a right of way for an electric transmission line, a landowner appealed to the Pennsylvania superior court on the basis of three principal contentions. It was said (1) that the company failed to meet its burden of proof to show that it was not practicable to reroute the proposed line to avoid the appellant's property; (2) that the company's action was

arbitrary and capricious since the line could be rerouted to avoid the land in question without affecting any additional landowners; and (3) that the company had not given proper consideration to the use of underground cables.

The company's evidence showed that a change in the course of the line would require the installation of heavier angle towers and would necessitate the procuring of additional rights of way over other properties. There was testimony that underground cables would not be feasible.

Utility Determines Route

In answer to the first two contentions of the appellant, the court indicated that the selection of routes for transmission lines is a matter for the utility in the first instance. Unless it is shown that it proposes to exercise the power of eminent domain wantonly or capriciously, or that the rights of the landowner are unreasonably disregarded, the commission is not required to withhold its approval merely because another route might have been adopted.

On the third contention, where the comparative costs of overhead and underground lines have been considered by the commission in determining whether the route selected was arbitrary or capricious, the court would not substitute its own judgment for the administrative determination unless the order were clearly unreasonable, unlawful, or abusive of discretion.

The necessity for the line was established. The location and manner of construction were dictated by considerations which, in the commission's judgment, were justifiably found controlling by the utility. Upon these considerations the court was bound to affirm the order. *Laird v. Pennsylvania Pub. Utility Commission, No. 204, June 11, 1957.*

Transfer of Carrier Permit Denied on Competitive and Statutory Grounds

THE Washington commission disapproved an application to transfer a motor carrier permit, because of the "new and different competitive effect" that would be created, and because of an insufficient showing as to property rights affected.

During the past few years the holder of the permit had reduced its considerable business to a point where it was no longer in real competition with other carriers in the area, though competition between the latter was intense. Their service was not shown to be inadequate. Furthermore, evidence indicated that they needed additional business to fully utilize equipment then in operation.

The holder of the permit, being in financial difficulties, proposed to transfer its authority to a large carrier which would undertake operations in competition with protesting carriers. The commission thought the transfer would produce competition which would be essentially destructive of existing service.

Property Rights Affected

A Washington statute relating to transfers of motor carrier permits requires a "proper showing that property rights might be affected thereby." But the only tangible property sought to be transferred by the holder of this permit consisted merely of a 2-ton truck and several filing cabinets, all at a price of $500. No evidence was offered regarding the going

value of the motor carrier business.

If the words "property rights" are to be given any meaningful effect, said the commission, the statute must be construed as requiring something more than a nominal transfer of personalty. To hold otherwise would be to encourage circumvention of the statute. Nor could the transfer of the permit in and of itself be considered as affecting property rights, the commission indicated. It was apparent that the "property rights" requirement of the statute was not satisfied by the applicant's showing. *Re Humphries Transport, Inc. et al. Order M. V. No. 67037, Hearing No. P-32135, June 17, 1957.*

Full Crew Law Inapplicable to Repair Yard Switching

ON a labor union complaint alleging violations of New York's full crew statute, the New York commission ruled that the statute was inapplicable. The complaint was made against the New York, New Haven & Hartford Railroad Company, which performed miscellaneous switching operations in the vicinity of its repair yard with a crew of three.

Section 54-c of the law, applying to railroads "of more than 50 miles in length within this state," requires a 5-man crew for "switching car or cars, or transferring, as a switching movement, a car or cars from one railroad to another or from one railroad yard to another railroad yard." It also provides penalties for violations.

The company urged that the commission had no jurisdiction because § 54-c did not expressly provide for administrative enforcement. The commission was of the opinion, however, that it had jurisdiction in view of its general supervisory authority over all common carriers and railroads, and its statutory power "with respect to their compliance with all provisions of law." It was further contended that the statute was inapplicable because the company had no integrated operation of 50 miles or more within the state. But the commission did not construe this 50-mile trackage limitation as meaning an integrated operation of 50 miles. On this point the statute would apply since the railroad clearly operated track distances of more than 50 miles.

The commission ruled that "switching car or cars" did not comprehend the hauling of individual pieces of motive equipment or cars in and out of the repair shop, or movements about the shop yard for inspection and repair. Moreover, the movements complained of were virtually isolated from all other operations of the railroad. *Sullivan v. New York, N. H. & H.R. Co. Case No. 17801, June 4, 1957.*

Broker's License Denied to Motor Common Carrier

THE California commission refused to renew a motor transportation broker's license for an applicant who had acquired radial highway common carrier authority, on the ground that it would be contrary to the public interest. For an individual to hold such dual authority would result in confusion as to whether he acts as a carrier or a broker with respect to a given shipment. Such confusion was evident in this case. The commission pointed out that a radial highway common carrier, through the use of subhaulers, can perform substantially the same operation as a motor transportation broker.

Enforcement of the rules and regula-

tions for both carriers and brokers, while already difficult, would become increasingly more difficult if this situation were allowed to exist, the commission stated. *Re Davi, Decision No. 55086, Application No. 38701, June 4, 1957.*

Traffic Count Shows Lack of Interest

THE Massachusetts commission authorized a transit company to discontinue operation on a certain route. Traffic counts had indicated that the route was being used by very few people. Present revenues appeared to average about 40 cents per trip, while a saving of approximately $3.19 per trip would be realized from the discontinuance.

The commission could not expect the carrier to operate for the convenience of a few patrons. The counts indicated that on many trips no passengers had been carried. The maximum number on any trip was six passengers.

The fact that a portion of a carrier service is unprofitable is not sufficient reason, standing alone, to warrant discontinuance of service, pointed out the commission, provided there is a demonstrated public need. On the other hand, where the public had indicated by lack of patronage, as here, that the service was not necessary, a carrier could not be compelled to continue an unprofitable operation.

Continued losses would have an indirect effect on other routes which would have to subsidize the loss. Continuance would be unfair to the public at large where the persons benefited were so few. *Re Springfield Street R. Co. DPU 11821-A, June 6, 1957.*

Passenger Trains Operating at Loss Discontinued

THE Missouri commission authorized the Chicago, Burlington & Quincy Railroad Company to discontinue two local trains operating between West Quincy, Missouri, and Brookfield, Missouri, a distance of 102 miles. The trains were being operated at an annual out-of-pocket loss of about $24,000, the obvious result of declining passenger patronage. During 1955, however, the company did earn a profit of 4.73 per cent on its system-wide operations.

The company proposed to have fast limited passenger trains serve the larger of the towns on the local line, while head-end traffic would be handled by a daily freight train. Several of the other towns on the line were served by motorbus, and the remaining small communities exhibited no real need for common carrier passenger service.

The commission found these proposals consistent with the public convenience and necessity.

The substitute service would not be able to carry mail on as good a schedule as the discontinued local trains. The correction of this problem, however, was left to the postal authorities. The company would not be compelled to continue the local trains at a heavy loss in order to carry mail to several intermediate points on the line. The commission agreed with the company that railroads owe no common carrier obligation, either to the postal authorities or the general public, to transport the U. S. mails. *Re Chicago, B. & Q. R. Co. Case No. 13,417, June 24, 1957.*

Other Recent Rulings

Blanket Authority. The Colorado commission, in refusing to extend a motor common carrier's operating authority to include blanket coverage of all points in the state on all commodities with special equipment vehicles, commented that if specialized equipment were the test, economic restrictions on presently certificated carriers would arise that would not permit them to improve existing service, thereby depriving a large section of the economy of improved service. *Re Wilson, Inc. Application Nos. 14784, 14778, Decision No. 47758, April 17, 1957.*

Return on Net Book Cost. The Illinois commission approved a 6 per cent return on a telephone company's net book cost rate base, resulting from increased switching service and toll rates. *Re Farmers Teleph. Co. 44001, May 21, 1957.*

Passenger Train Discontinuance. The New York commission pointed out that, in passing upon an application for discontinuance of passenger train operations, losses from such operations were not the only factor to consider, but that the charter obligation to provide such service, the financial results of the entire operation, earnings from freight traffic moving on, to, or from the division, and whether or not public convenience and necessity required continuance must also be considered. *Re New York C. R. Co. Case 18033, May 14, 1957.*

Division of Crossing Costs. The Missouri commission directed the state highway commission and a railroad to share equally the cost of installing additional protective devices at an existing grade crossing where federal funds were not used for the project and consequently a federal statute limiting the assessment against a railroad to not more than 10 per cent was not applicable to the proceeding. *Missouri State Highway Commission v. Wabash R. Co. Case No. 13599, May 10, 1957.*

Intercity Fare Increase. A motor common carrier of passengers and express was authorized by the Utah commission to increase intercity fares in order to provide a fair share of over-all revenue requirements from such traffic upon a showing that the increase would not result in excessive earnings and was in the public interest. *Re Lewis (Lewis Bros. Stages) Case No. 4436, May 2, 1957.*

Telephone Rate of Return. The Wisconsin commission approved a proposed rate increase for a small customer-owned telephone system, sufficient to afford a rate of return of 4.7 per cent on an estimated net book value rate base. *Re Northfield Farmers Teleph. Co. 2-U-4751, April 29, 1957.*

Telephone Rate of Return. An increase in exchange rates, effective upon cutover to dial service, was authorized by the Wisconsin commission for a telephone company, affording a rate of return of 6.5 per cent on a net book value rate base. *Re St. Croix Teleph. Co. 2-U-4761, April 29, 1957.*

Interexchange Service Discontinued. The Wisconsin commission authorized a telephone company to discontinue unlimited interexchange service in view of the fact that an extremely high percentage (from 65 to 74 per cent) of the total subscribers in the affected exchanges did not use the interexchange service. *Re Dickey-*

ville Teleph. Corp. 2-U-4707, April 19, 1957.

Agency Stations Retained. In the face of local shippers' protests showing a reasonable need for continued agency service, together with evidence of revenues in excess of direct station expenses, the Wisconsin commission denied applications by two railroads for authority to discontinue agency service in small rural communities. *Re Chicago, B. & Q. R. Co. 2-R-3158, April 11, 1957; Re Green Bay & W. R. Co. et al. 2-R-3163, April 19, 1957.*

Qualified Examiner Required. In a reparations proceeding before the Interstate Commerce Commission involving demurrage and penalty charges by a carrier, the elimination of an oral hearing did not dispense with the necessity of an initial decision or recommendation by a qualified examiner as provided by § 11 of the Administrative Procedure Act, a federal district court ruled. *Reliance Steel Products Co. v. United States et al. 150 F Supp 118.*

No Implied Limitation. The Missouri court of appeals held that no limitation upon the right of a municipality to construct and operate a power plant in competition with an electric company could be implied without a showing of an express agreement between the city and the company that the franchise to maintain an electric distribution system within the city was exclusive. *Missouri ex rel. City of Mansfield v. Crain, 301 SW2d 415.*

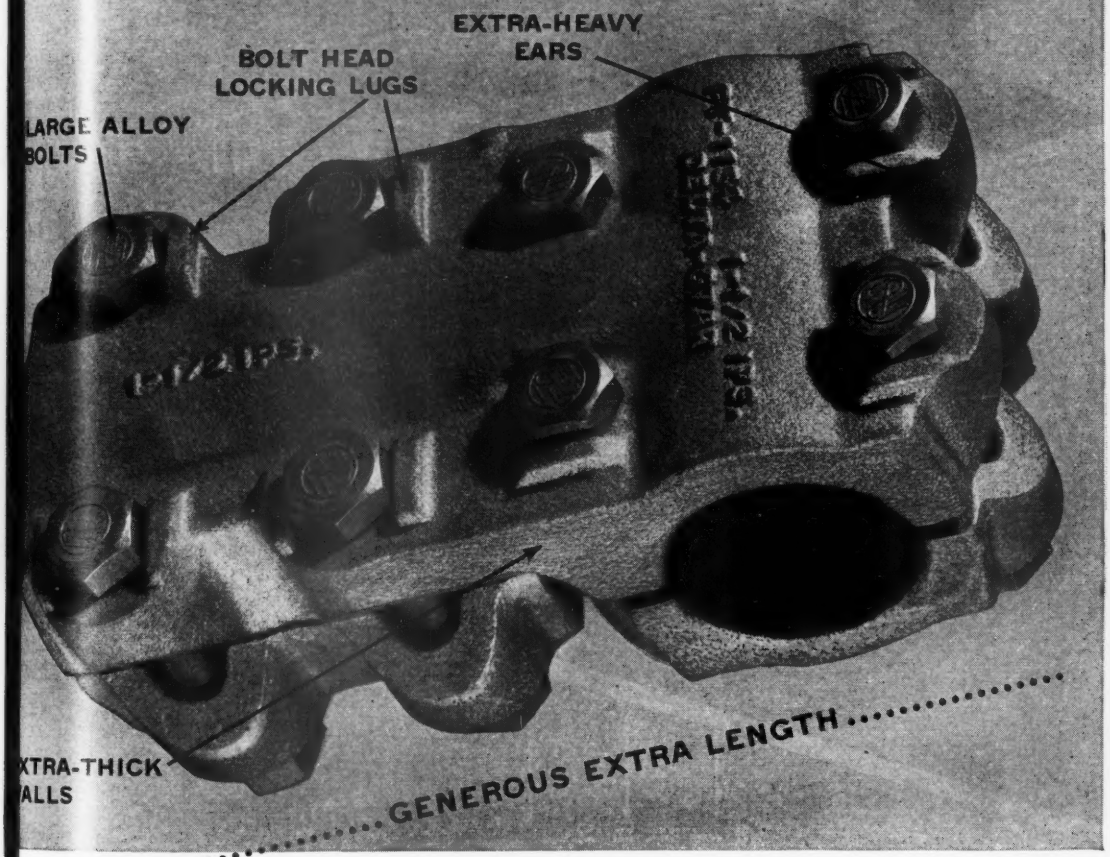
Denial of Service for Nonpayment. The Kentucky court of appeals held that a statute authorizing cutting off of municipal water service in the event of unpaid sanitation district sewer service charges was not unconstitutional on any theory of impairment of the obligation of contract between the city and its water customers, or between the city and its waterworks revenue bondholders, or on any theory of arbitrary discrimination against water customers not paying sewer service charges. *City of Covington v. Sanitation Dist. No. 1 of Campbell & Kenton Counties, 301 SW2d 885.*

Allocation of Viaduct Cost. The Missouri commission allocated the cost of a proposed viaduct over a number of railroad tracks in Kansas City substantially one-half to the city and one-half to the railroads, while maintenance costs for the approaches, pavement, walks, and guard rails would be borne by the city, with all other maintenance costs divided equally between the two interests, where the tracks were solely responsible for the need of the viaduct. *Re Kansas City, Case No. 13,656, June 13, 1957.*

Electric Department Return. A return of 5.97 per cent on a power company's electric properties' rate base was considered reasonable by the Massachusetts commission. *Re Nantucket Gas & E. Co. DPU 12072, DPU 12121, June 14, 1957.*

Collateral Attack on FCC Order. The United States court of appeals refused to allow the owner of a radio station appealing from a Federal Communications Commission grant of unlimited operation to another radio station on the same frequency to attack, for the first time, the commission's treatment of his exceptions. *Albertson v. Federal Communications Commission, 243 F2d 209.*

New..Delta-Star Heavy Duty Aluminum Connectors!



Delta-Star announces a complete new line of connectors. Extra rugged construction and engineered for maximum service life under all conditions... Particularly important in this new line are the heavy walls and generous overall dimensions. With these features pressure is distributed to permit optimum contact yet with negligible cold flow...All sizes and ranges of conductors are cast on surface of each connector...Can be supplied in types and sizes to meet all connector requirements. For further information, write Delta-Star Electric Division, H. K. Porter Company, Inc.—2437 West Fulton Street, Chicago 12, Illinois.

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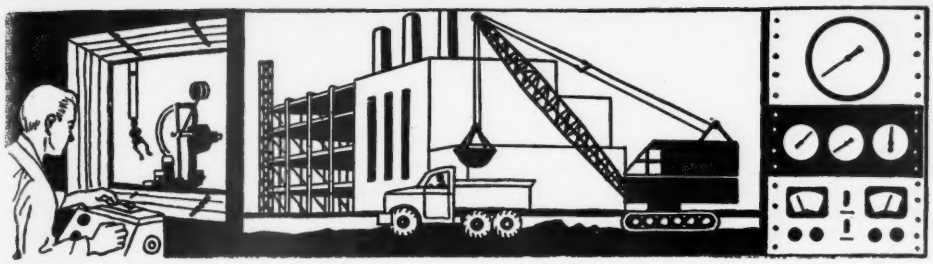


Industrial Progress

de Fair of Atomic Industry Week of October 28-31 In New York

VERAL atomic events are planned the week of October 28-31, 1957. week will start off with the open- of the 1957 Atomic Industry Trade in the New York Coliseum and Fourth annual Atomic Industry ference. The latter will be held at Plaza and Waldorf-Astoria Hotels the Coliseum. Sponsor of both ts is Atomic Industrial Forum, representing over 600 industrial public utility companies, domestic foreign, in the nuclear develop- t field. At the same time, the erican Nuclear Society will meet e Henry Hudson Hotel with some ions scheduled for the Coliseum. ctober 29th will see the opening he second annual conference on reers in Nuclear Science and En- ering," sponsored by the Commit- n Education of the Atomic Indus- Forum. October 31st will be high- ed by a session on reactor safety sored by the American Nuclear ety, Atomic Industrial Forum and J. S. Atomic Energy Commission. rmation on the sessions and con- nces, as well as complimentary ts for admission to the Atom le Fair, can be had by writing to ibit Manager, Atom Fair, 3 East Street, New York 22, N. Y.

Power From AEC's Sodium Reactor Experiment

CTRIC power was produced for irst time July 12th by heat from Sodium Reactor Experiment dur- ests of the reactor and auxiliary ponents. The plant is located in Santa Susana Mountains about 30 s northwest of Los Angeles.

he SRE, designed and built for Atomic Energy Commission by mics International, a Division of North American Aviation, Inc., is a part of the commission's program to develop economically competitive civilian power from nuclear energy. The Southern California Edison Company has installed electrical generating equipment adjacent to the nuclear reactor to convert to electricity reactor heat energy which the company purchases from the commission.

The electricity produced was fed over the company's distribution lines. The experiment marked the first time a *non-military* atomic energy reactor has produced power for the generation of electricity by a private utility company.

Following numerous experiments to test the operation of all components, the reactor plant will be operated at full power late this year. The reactor is designed to produce 20,000 kilowatts of thermal energy from which the Edison equipment will generate approximately 6,500 kilowatts of electricity. In the first test the generator operated at a level of about 1,000 kilowatts of electricity. The generating facilities will operate intermittently, depending upon the experimental operation of the reactor. The Edison Company will share with other power generating organizations the information it gains from the SRE program.

Nuclear Power System for Export Designed by B&W

THE Babcock & Wilcox Company recently made public its design for a nuclear steam generating system which would satisfy the requirements of electric utility companies of foreign nations now in the market for atomic power plants.

As described to a group of 60 European industrialists and government officials during a visit to B&W's nuclear facilities plant in Lynchburg, Va., the "pressurized water" type reactor design is suitable for a utility plant of about 133,000 electrical kilowatt capacity.

Using thermal energy generated by fuel elements containing slightly enriched uranium, the nuclear plant would produce nearly 2,000,000 pounds of steam per hour to drive a turbogenerator set. It was also indicated that the steam generating capacity and electrical output of the plant might be increased, if desired, by means of a steam superheater burning conventional fuels.

The proposed reactor uses light water as a "moderator" to slow neutrons down to more effective speeds during the fissioning process. At the same time, this medium serves to transfer heat from the fuel elements to a heat exchanger, where the steam is produced.

Members of the group to whom details of the reactor were presented are all key participants in the program for atomic development in Europe. Representing Belgium, France, Germany, Italy, Luxembourg and The Netherlands, they are currently touring America's principal nuclear facilities under the auspices of the U.S. Atomic Energy Commission and the Department of State.

EEI Announces Fall Range Plans

"COOK Better . . . Electrically" will be the theme of the Edison Electric Institute Fall Range Campaign, it was announced recently by Edward J. Hurley, chairman of the EEI Residential Promotion Committee and Director of Residential & Rural Sales, The Detroit Edison Company, Detroit, Michigan.

The campaign, which will run the months of September, October and November, offers many attractive sales aids and materials especially designed for locally coördinated electric range

(*Continued on page 26*)

campaigns at the retail level. Based on the national "Live Better . . . Electrically" industry theme, these materials feature the many advantages of cooking electrically.

Photostatic copies of campaign materials have been sent to allies in the electrical industry so that they might coördinate any similar materials that they make available along with this "Cook Better . . . Electrically" material. These materials are prepared for use in the fall months based on the EEI Coördinated Calendar which is also used as a base by national electrical manufacturers in the scheduling of their product advertising.

Low-Power G-E Reactor To Provide Nuclear Data

THE Atomic Energy Commission proposes to issue a license to the General Electric Company authorizing operation of the company's boiling water power reactor in Alameda county, California, for performance of critical tests.

Notice of the proposed issuance was published in the Federal Register on July 11, 1957. The license will be issued unless a request for a hearing is received within 15 days after that date.

The license will not authorize operation of the facility as a power reactor for the production of electricity. Pending completion of the company's reactor safeguards report and its evaluation by the commission, the license will authorize operation only as a critical facility at a thermal power level not to exceed 1,000 watts. At this low power GE plans to conduct experiments to determine nuclear characteristics of the reactor core.

When it goes into operation as a fully functioning power reactor the GE facility will operate at a thermal power level of 20,000 kilowatts and will furnish heat for the production of 5,000 kilowatts of electricity.

GE has advised the commission that the steam produced in the reactor will be furnished to a turbine generator owned and operated at the site by Pacific Gas and Electric Company. The electricity produced will be fed into the PG&E transmission system. The reactor will be used also to obtain technical data for the full-scale boiling water power reactor GE is building for the Grundy county, Illinois, nuclear power plant of Commonwealth Edison Company.

Stone & Webster Award Cites Safety Record on Construction Job

STONE & Webster Engineering Corporation has presented its 1956 safety award to members of its field office at Redondo Beach, Calif., where a steam power plant is being built for Southern California Edison Company.

The company's William N. Patterson award was given in recognition of project workers having achieved the best construction safety record of all Stone & Webster projects in the U.S. during 1956.

The Redondo Beach project force held down accidents to a frequency rate of 7.66 per million man-hours worked during the year. This compares with a frequency rate of 15.7 for all Stone & Webster construction jobs and 19.10 reported by the National Safety Council for all construction jobs throughout the country.

The Redondo steam station project operated from its inception in la

55 for 13 months without a lost-
ne accident. A total of more than
0,000 man-hours were worked dur-
g the period.

Although construction for industry
considered one of the most hazard-
s occupations, the Stone & Webster
tes for frequency and severity of
cidents have declined for four con-
cutive years, according to a report
T. Cortlandt Williams, president.

The severity rate as represented
days lost per million man-hours
orked was 1,858 on Stone & Webster
bs throughout the U. S. in 1956 as
mpared with the Council's national
te for all construction of 2,375
ys lost.

Visits to Shippingport Reactor Limited to Official Groups

HE Atomic Energy Commission
d the Duquesne Light Company
ve limited visits to the Pressurized
ater Reactor (Shippingport, Penn-
lvania) to official groups during the
maining stages of construction and
e-operational testing.

In April, 1957 it was found neces-
y to restrict visits to non-working
urs on Sundays in order not to in-
fere with operations. The project
now in the final construction stage
d intricate component and systems'
sting is underway on a round-the-
ck, seven-day-a-week basis.

It is expected that the plant will
ain be open to visitors including
nited States and foreign industry
presentatives after it has been in op-
ation.

Four Wheel Drive Introduces New Utility Digger

NEW four-wheel-drive earth-bor-
g and pole-setting vehicle, said to be
e first rubber-tired chassis of its
nd designed especially as a digger
rrier for utilities, utility contractors,
d railroads, has been announced by
ur Wheel Drive Auto Company,
intonville, Wis.

Called the FWD Blue Ox Utility
BXU) digger, the new vehicle was
veloped and built by FWD for spot
stallation of new and replacement
les as well as for new line construc-
n and operations ordinarily requir-
g crawler tractors. The new BXU
n be driven over paved or unpaved
ads to job locations at speeds up to
miles an hour without damage to
e roadbeds. Its high traction and
neuverability characteristics enable
o traverse soft grades and muddy,
sandy, rough, and other adverse ter-
rain to reach digging and pole-setting
sites.

The FWD Blue Ox Utility vehicle has rear-mounted digger and winch and can be equipped with an additional front-mounted winch. Or the chassis can be outfitted with an aerial tower for use in off-road power-line maintenance, insulator washing, and similar tasks.

The unit is equipped with forward seat and controls for driving the vehicle and rear seat and platform, with complete engine and digger controls, for digging operations. In transit, the digger unit rests in a cradle alongside the driver's seat.

The unit is designed for use with or without fold-down windshield and canopy. It is available with one- or two-man front seat and the rear seat, at earth-boring and winch controls, is optional. It also is available with enclosed cab and rear fenders.

G-E Introduces New Low-Voltage Switchboard

A NEW low-voltage switchboard, built in standardized modules for application versatility, was announced recently by R. C. Wilson, manager-marketing for General Electric's Distribution Assemblies Department. This new switchboard is designed for any incoming service, 600 volts or less. Its mains are rated 800 through 4,000 amperes.

The new switchboard is designated the Type DR Universal because the structure and vertical bus bars are drilled to accommodate virtually any combination of seven different low-voltage protective devices.

These seven protective devices are divided into three classes: (1) circuit breakers—both molded-case breakers and large AK air circuit breakers; (2) circuit breaker, current-limiting fuse combinations, either the standard breaker with current-limiting fuses or the current-limiting, molded-case breaker with integrally mounted current-limiting fuses; and (3) fused interrupter switches: including the General Electric new Type QMR interrupter switch; a non-automatic breaker with series fuses, and the General Electric Type LB-1 service protector, a new combination high-capacity switch with current-limiting fuses for service entrance and feeder applications.

The new Type DR switchboard is pre-engineered to predetermined standards and constructed in unitized modules. This feature, Mr. Wilson explained, makes it possible to completely lay out, price and dimension this new switchboard from published information. It also allows protective devices to be added, replaced or rearranged in the field with minimum labor. Further it permits the ordering and installation of additional sections in the field with complete assurance that they will match and line up with earlier installations of this new switchboard.

An Award of Merit was recently presented General Electric Design Engineer W. F. Olashaw for his redesign of the back-connected stud assembly in this new switchboard. The award was given by *Materials and Methods* Magazine for the best use of materials in product design.

Westinghouse Breaks Ground For World's First Industry-Owned Nuclear Testing Reactor

GROUND breaking on July 8th signalled the start of construction on the Westinghouse Testing Reactor, the world's first industry-owned nuclear materials testing reactor. The site of the new testing reactor is on an 850-acre tract, 29 miles southeast of Pittsburgh.

Charles H. Weaver, vice president in charge of Westinghouse atomic power activities, said the full-scale testing reactor, known as WTR, will operate in the range of 20,000 kilowatts or above, and will be used to test materials under conditions similar to those in a power reactor.

The reactor will be housed inside a vapor-tight steel shell and will be "inherently safe" due to built-in safety features.

"When in operation," Mr. Weaver said, "WTR will provide the much needed facilities to test reactor fuel elements and other components of atomic power plants under actual operating conditions. Heretofore, private industry has had to depend on limited government facilities, such as the Atomic Energy Commission's Materials Testing Reactor in Idaho, for development work on fuel and materials for nuclear power plants.

"WTR will be of an advanced design and will use highly enriched uranium as the power source, and water as moderator and coolant. The test holes into which materials may be placed to be irradiated will afford

(*Continued on page* 28)

INDUSTRIAL PROGRESS (Continued)

greater flexibility than any reacto built in this country. Large test bles will pierce the nuclear core i and will be big enough to test size fuel specimens."

E. T. Morris of the Westingh atomic power department is man of the WTR project.

Holan Brochure Describes New Series Power Derrick

A 4-PAGE brochure has just published by J. H. Holan Corpora to describe the operating feature its new Series 6800 Power Derri

The brochure has field photos in dition to features, dimensions an pacities for the derrick with or wit extendible boom head.

Permanent Test Hole Develop By Heath Survey Consultan

A NEW, permanent leakage test assembly has been developed by H Survey Consultants, Inc., Welle Mass. Featuring a neoprene i that is self-sealing, the "Auto-T Insert" unit is designed to facil both accurate and rapid location o leaks in paved areas. Patent has applied for on the Heath "A-T-I" invented by Charles A. Heath, president of the firm.

The "A-T-I" unit is installe specially selected locations along lines in downtown or other a where frequent drilling of test h is both costly and hazardous. W leakage control surveys are mad probe is inserted through a hole i brass top of the unit, forcing op neoprene diaphragm which norm seals the unit. A sample of sub-so mosphere is taken and the probe w drawn. The neoprene diaphr springs back to its original posi and reseals the test hole.

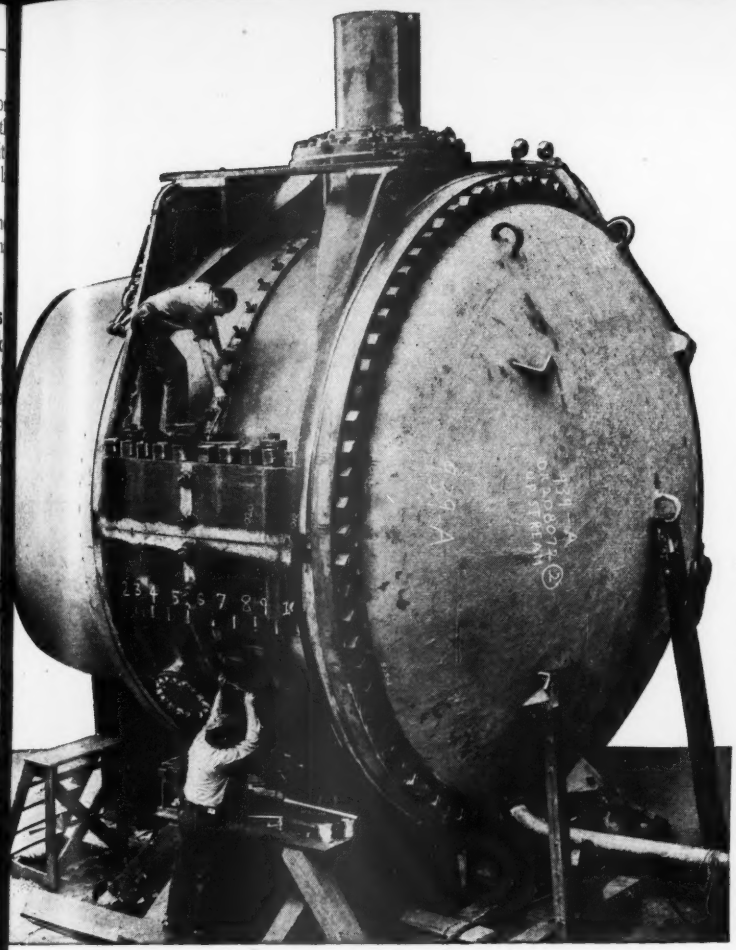
It is estimated by Heath Su Consultants that the use of method in downtown or other pa areas will permit the making of l age control surveys in one-quarte one-sixth of the time required previous methods.

Additional information about "A-T-I" permanent test hole assem can be secured from Heath Su Consultants, Inc., 573 Washing street, Wellesley 81, Mass.

Gas Industry Construction Expenditures at Record Pea Of $2 Billion This Year

THE gas utility and pipeline indu will spend a record-breaking tota

(*Continued on page* 30)



This 16-Foot Butterfly Valve Illustrates the type of work which Newport News takes in stride. Newport News built 3 such valves, each weighing 446,000 lbs., for the Ross Power Plant, Skagit Project, Department of Light, City of Seattle, Washington. Designed for a water flow of 3,620 cu. ft. per sec., and a hydrostatic pressure of 290 psi., these valves were shop tested by Newport News at 450 psi. They are hydraulically operated with oil at 1,500 psi. pressure. Shop tests assure speedy, trouble-free assembly of Newport News built equipment, on the site.

The TEST of a TITAN

Here is one of the largest high head butterfly valves ever built, undergoing a shop test at Newport News. If you had an opportunity to follow this unit from start to finish, you would see *first hand* how Newport News produces massive equipment *economically*. For economy is a basic advantage that results from Newport News' high integration of skill and production facilities.

Large engineering and technical staffs, operating a plant comprising acres of brass, iron and steel foundries, five huge machine shops and other extensive fabricating facilities, have made Newport News one of the world's largest producers of hydraulic turbines, valves, gates, penstocks and other essential equipment... both standard and special in design.

Let us bid on your equipment. Write us today for your copy of *"Water Power Equipment."*

NEWPORT NEWS

SHIPBUILDING AND DRY DOCK COMPANY
Newport News, Virginia

$2.13 billion this year for new construction and expansion of present facilities throughout the United States, the American Gas Association reported recently upon completion of a national survey. The sum is an increase of 37 per cent over last year's previous all-time high of $1.55 billion.

Expenditures over a four-year period, 1957 through 1960, are forecast at $8.7 billion, with 97 per cent going for natural gas facilities. This compares with $5.3 billion spent in the previous four-year period (1953-56) and $4.7 billion in the 1949-52 period.

Nearly half of the 1957 outlay will be for transmission purposes—$1.028 billion. Other anticipated expenditures will include $560 million for distributon, $380 million for production, $106 million for general purposes, and $54 million for underground storage.

The gas industry now has a network of mains stretching nearly 524,000 miles after adding 28,450 miles in 1956. Transmission facilities were expanded by 7,900 miles, field and gathering networks by 1,840 miles, and distribution mains for local service by 18,710 miles. This expansion enabled the industry to add slightly more than its recent annual average of one million new customers. The industry now serves over 30 million customers, in addition to eight million customers living beyond utility mains who used liquefied petroleum ("bottled gas").

Natural gas transmission facilities will be expanded at an estimated cost of $3.89 billion in the 1957-60 era, compared to $2.35 billion spent during 1953-56, the A. G. A. reports. Natural gas distribution facilities will require an expenditure of $2.76 billion in the next four years, against $1.56 billion in the previous four years.

Underground storage facilities will be increased by $353 million in the next four years, an increase of 80 per cent in investment in these facilities which the industry considers so important for more effective service to heating customers and higher load factors for pipeline suppliers.

The impact of curtailed housing activity this year is expected to be minimized by customer increases resulting from the recent introduction of natural gas in the Pacific Northwest. Further increases in gas heating customers are also expected in areas where service restrictions have been in effect. The limitations are being reduced as the industry accelerates its expansion program.

Two major pipeline systems—by Pacific Northwest Pipe Line Company and American Louisiana Pipe Line Company—were completed in 1956 as natural gas construction expenditures climbed to $1.47 billion. Among the major projects in this year's outlays is an expenditure of $154 million by the Coastal Transmission Corporation and the Houston Oil and Gas Corporation for facilities to transport natural gas from the Gulf Coast of Texas to peninsular Florida.

AGA Industrial-Commercial Achievement Award to Be Presented at Gas Convention

THE first annual Industrial-Commercial Achievement Award of the American Gas Association will be presented at the A. G. A. convention to be held October 7-9 in St. Louis.

The Award will honor annually the individual selected as having made "an outstanding personal contribution to the gas industry which has enhanced the use of gas for industrial and commercial purposes." Such a contribution may be in research, invention, sales, advertising, safety, customer relations, or any other activity promoting the development of industrial and commercial applications of gas.

Regular employees of any member gas company of A. G. A. are eligible for the Award, consisting of $500 and a certificate, with August 15 as the deadline for entries. The Award is sponsored by the Moore Publishing Company, publishers of *Gas Age and Industrial Gas.*

Ground Broken by SYLCOR Nuclear for Plant to Produce Nuclear Fuel Elements

GROUND was broken recently at Hicksville, N. Y., by Sylvania-Corning Nuclear Corp. for a new plant to manufacture nuclear fuel elements for atomic reactors. Participants in the program included Hon. Leonard W. Hall, former Republican national chairman; A Holly Patterson, county executive of Nassau county; Lewis N. Waters, supervisor of the Town of Oyster Bay; and Dr. Lee L. Davenport, SYLCOR Nuclear president.

"Our new Hicksville plant will be another significant step towards the realization of the benefits of the peaceful atom," Dr. Davenport said. As an illustration of the type of product plant will manufacture, he cited fuel elements which SYLCOR clear is making for the research actor at the Brookhaven Nat Laboratory, Upton, N. Y.

Five thousand fuel elements new design are being made to "re the Brookhaven reactor under a tract announced late in June for a one quarter of a million dollars. SYLCOR Nuclear president said Brookhaven contract was for the est number of atomic fuel elem ever ordered on the commercial ket for a non-military purpose. A element shape of the Brookhaven was used as part of the handle o groundbreaking shovel.

Robert B. Smith Assigned To AGA Post

Robert B. Smith, coördinator research for the Columbia Gas tem Service Corporation, has temporarily assigned to the Amer Gas Association to fill the newly ated post of manager of Air Co tioning Research under the P Plan. The assignment was announ by George S. Young, president o Columbia Gas System, Inc.

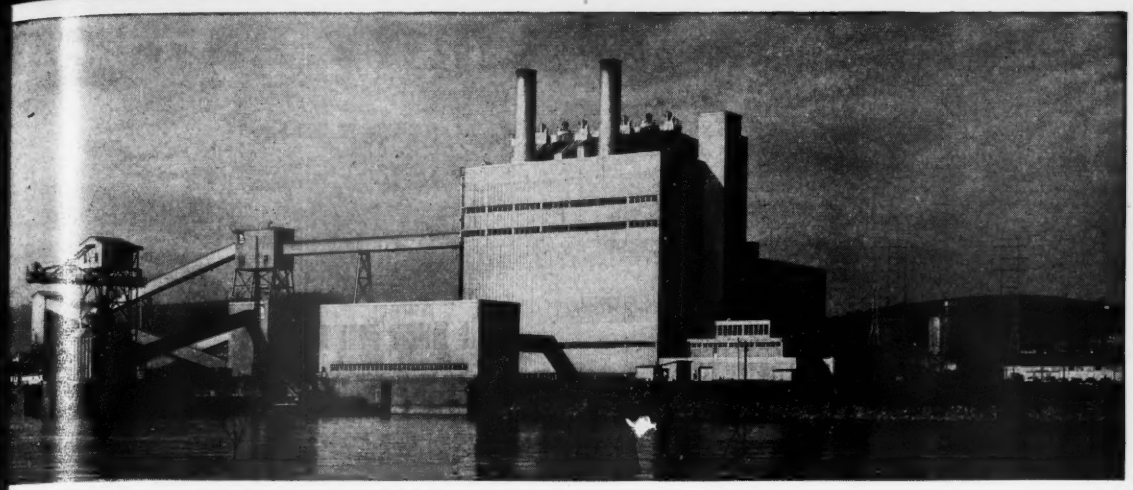
Mr. Smith, who will supervise AGA's accelerated research prog in air conditioning, was gradu from Ohio State University in with a degree in mechanical engin ing. He joined Columbia Gas Sy as a junior engineer, advanced to gineer and then to Coördinator of search.

He has been active in the Amer Gas Association since 1951, servin the Marketing Research Commi Subcommittee 8 of B31, and an o nal member of the AGA Task G for Air Conditioning.

Copes-Vulcan Bulletin

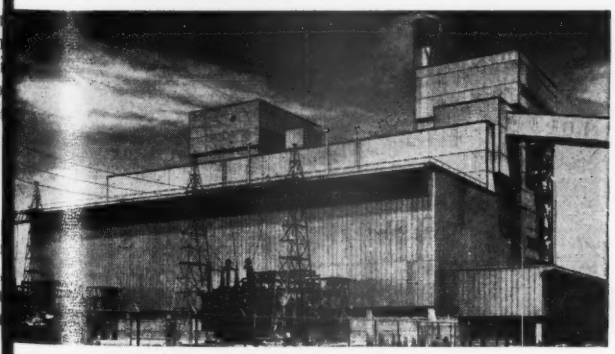
BULLETIN No. 1033, recently lished by Copes-Vulcan Divi Blaw-Knox Company, Erie, Pa. scribes pneumatic power drive designed for the remote operation positioning of valves, dampers, vers, rheostats, vanes and vari speed drives.

The 4-page bulletin explains principle of operation including erating characteristics, and gives chanical specifications. A table of torque ratings and weights, to output curves and dimensional d ings provide all data needed to de these devices into a control syste

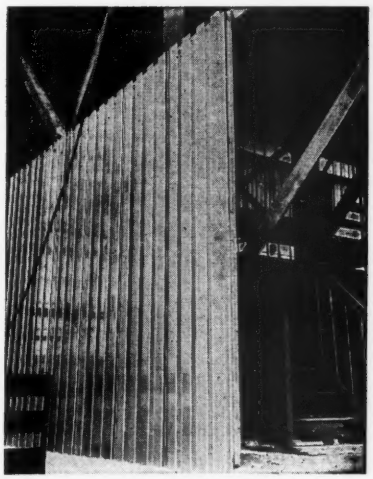


Why fine new power plants everywhere have Q-Panel Walls

Builders of new power plants in all parts of the country have specified Q-Panel walls for the following very good reasons: 1. Q-Panels are permanent, dry and noncombustible, yet may be demounted and re-erected elsewhere to keep pace with expansion programs. 2. Q-Panels are light in weight, thus reducing the cost of framing and foundations. 3. Q-Panels have high insulation value . . . superior to a 12" masonry wall. 4. Q-Panels are quickly installed because they are hung, not piled up. An acre of wall has been hung in 3 days. For more good reasons for using Q-Panel construction, use the coupon below and write for literature.



Q-Panel walls grace the new Elrama Power Plant (above) near Pittsburgh. It was designed by Duquesne Light Company's Engineering and Construction Department. The Dravo Corporation was General Contractor.



Q-Panel walls (above) go up quickly in any weather because they are dry and hung in place, not piled up.

More than 32,000 sq. ft. of Q-Panels were used to enclose the impressive Hawthorn Steam Electric Station (left) of the Kansas City, Missouri, Power and Light Company. Ebasco Services, Inc., designed and built the plant.

Robertson

Q-Panels

H. H. Robertson Company

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Offices in Principal Cities

Please send a free copy of your Q-Panel Catalog.

NAME

FIRM

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PUF1

CONDUCT OF THE UTILITY RATE CAS

by Francis X. Welch, B. Litt., LL.B., LL. M.

THIS is the companion volume to "PREPARING FOR THE UTILITY RATE CASE." It deals with those procedural matters which come after the preparatory stages of the rate case. It presents *for the first time* the *practical problems* of conducting the case—

- ► **filing the application**
- ► **introducing the evidence**
- ► **examining the witnesses, etc.**

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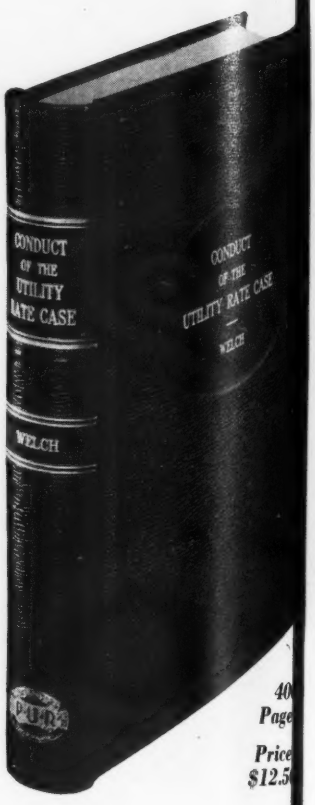

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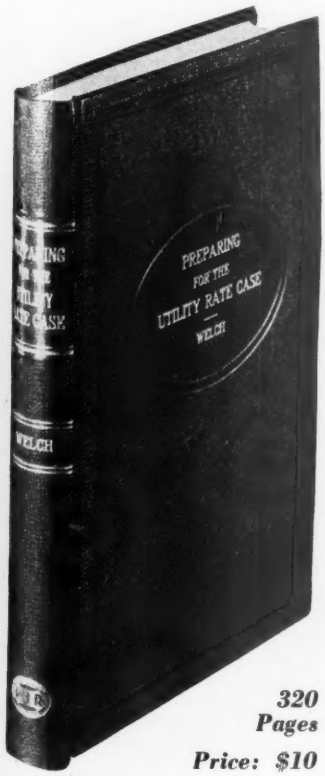

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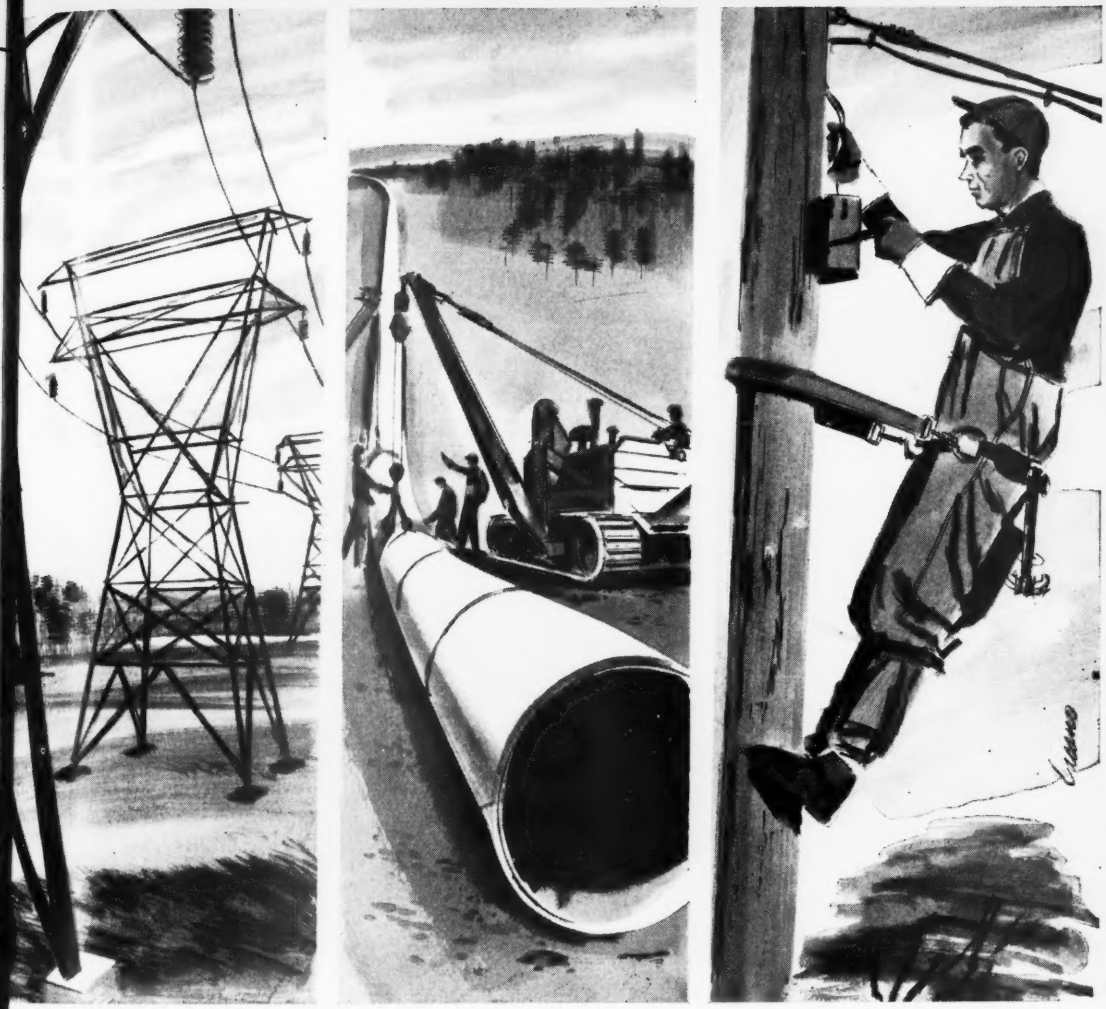

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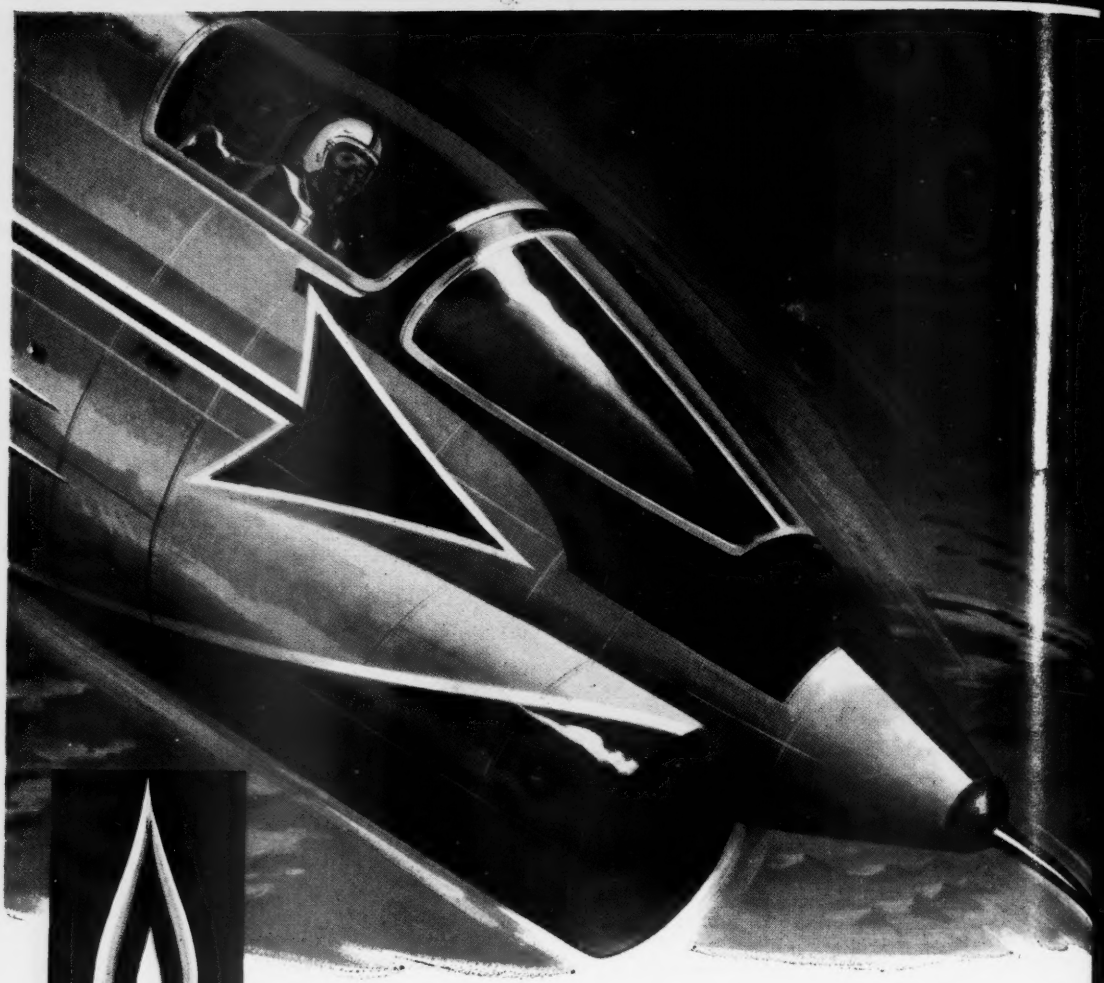

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